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RELATION OF RATE ADJUSTMENTS TO THE VOLUME OF SERVICE

The relation of the cost of telephone service to its public use is an interesting question that is receiving the attention from companies, regulatory bodies and economic observers in several parts of the country at this time. Just what is the point in the fixing of service rates where the increased cost results in less use of the telephone? That is the problem under consideration.

Generally speaking, all agree that telephone service is worth much more than its cost. All business is based on the principle that the commodity purchased is worth more to the buyer than the money he pays for it. Otherwise, there wouldn't be much trade. In times of need nobody stops to think of the cost of service—the main thing is to put through the emergency telephone call.

However, all telephone companies in adjusting their rates find it necessary to avoid raising the cost to a point where loss of subscribers would result in a net loss of revenue, thereby defeating the original purpose of the rate adjustment.

* * * *

In New York, where the increase in Bell rates has raised a storm of protest, certain developments in the situation are throwing a light on some curious reactions in the public mind. In a letter to a city paper, for instance, one man says:

"I believe the telephone company's increase of its rates is going to prove a boomerang. It has brought the public to its senses and made it 'elephone-minded.' In this country we use the telephone too freely and in many instances unnecessarily.

"Already an institution with which I am associated, having over 100 employes, has sent a written notice to its staff prohibiting personal calls and directing the switchboard operator to note each outgoing call. In my office every outgoing call is being entered, with the result that the number of calls has substantially decreased. The net result to the company, in spite of the increased rates, will prove a minus quantity."

* * * *

Many business houses for years have had rules to restrict the use of office telephones by employes for personal calls, not only because of the company expense but to prevent them wasting time from their work. In fact, the latter reason has been the more important in the minds of company managers who are more intent on keeping employes on the job than in saving a few dollars on the telephone bill.

The recent rate increase which raised such a hullabaloo in the newspapers, no doubt brought the matter afresh to the mind of the concern referred to in the letter. With nine out of ten business concerns, restriction of personal use of the telephone by employes would be for the purpose of increasing office efficiency rather than keeping down telephone bills.

* * * *

Of course, the idea that people in the United States "use the telephone too freely" will not meet with very wide acceptance. Figures show that this country holds a big lead over the rest of the world not only in the number of telephones but in the daily number of messages, per capita, but it is universally conceded that one of the principal reasons why the United States also leads the world in business activity and efficiency is because of the wide use of quick communications. Telephone service will continue to grow in volume, instead of diminish, regardless of rate controversies.

* * * *

It stands to reason that no telephone company would desire rates so high as to lead to a loss of business—even in the remote contingency that the regulatory commission would permit them. No merchant fixes prices so high that they drive customers away, and the utility company sells service with the similar idea of attracting, not repelling, patronage.

Adequate rates are guaranteed service companies by the laws of regulation. In general they are devised to attract public patronage as well as to give the company the revenue necessary to furnish good service and yield a reasonable return on the investment. If rates cause a loss of revenue, they are not "adequate" in the best sense of the word, but such cases are few and far between. The commissions see to that even though the company should overlook the point.

Illinois Regulation.

State regulation of service companies has much to commend itself to popular

favor, but there are frequent examples of its administration that give it an awful black eye. The Chicago telephone rate case is a recent instance.

In 1922 the Illinois utility commission (called the "Commerce Commission"—though why "commerce"?) reduced Illinois Bell Telephone rates in Chicago and the company got a federal court injunction, temporarily restaining the commission from enforcing the lower rates.

The company continued to collect rates according to its own schedules, impounding the extra money while waiting for a final settlement of the case. This amounted to over $11,000,000 which the Chicago politicians told the public they would get back—if the new rates were finally refused.

* * * *

That was 8 years ago, during which time taxpayers' money was freely spent in litigation and, of course, the company also was put to great expense in defending the suit. Now the federal court has handed down a final decision of the case, finding for the company, and stating in plain terms that both the state commission and the city officials bungled the job completely.

The court censured them for negligence and inefficiency in a fashion that must be embarrassing to the advocates of state utility regulation. The injunction that has been "temporary" for eight years is made permanent, and the only hope of the politicians to keep the eleven millions from fading out of the picture, is a successful appeal to the United States Supreme Court—and that is a hope decidedly faint.

With the idea of not entirely abandoning the eight-year fight, the Chicago Daily News editorially advises the authorities to start a new inquiry into the fairness of telephone rates, with due regard to the trend of court decisions bearing on the various phases of the utility situation.

* * * *

State pride is an interesting and attractive characteristic. It indicates a live interest in what is going on around us, and an optimism that helps progress. You usually hear something worth while when a man speaks words of praise of his state or town.

For instance, Chairman Curtiss, of the Nebraska State Railway Commission, in his address before the state telephone convention said that Omaha, with 284 telephones per thousand of population, leads the country in telephone saturation, and that Lincoln, with 262 stations per thousand, is fourth.

This statement is likely to be challenged by other cities, probably by Los Angeles or San Francisco, for California grows uneasy at the thought that other sections are ahead of her in any important particular. Can any other cities dispute Chairman Curtiss' claims as to Omaha?

COMING CONVENTIONS

Oklahoma Utilities Association, Tulsa, New Tulsa Hotel, March 11, 12 and 13.

North Dakota Telephone Association, Grand Forks, Hotel Dakotah, March 11, 12 and 13.

Texas Independent Telephone Association, Fort Worth, Texas Hotel, March 18, 19, 20 and 21.

Iowa Independent Telephone Association, Des Moines, Hotel Fort Des Moines, April 8, 9 and 10.

Ohio Independent Telephone Association, Columbus, Deshler-Wallick Hotel, April 15, 16 and 17.

Indiana Telephone Association, Indianapolis, Claypool Hotel, May 6, 7 and 8.

Kansas Telephone Association, Topeka, Hotel Jayhawk, May 13, 14 and 15.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 13, 14 and 15.

Up-State Telephone Association of New York, Rochester, May 21, 22 and 23.

Transmission and Signal Maintenance

Main Difficulty in Repairing Telephone, Switchboard or Other Telephone Apparatus Lies in Locating the Trouble—Points to Remember in Clearing Trouble on Common Battery Induction Type Circuits—Other Transmission Suggestions

By R. E. Daniel,
Manager, Winona Telephone Co., Winamac, Ind.

With the increased use of telephone for toll or long distance service, a great deal has been written concerning transmission maintenance. Many telephone men take much pride in their toll line facilities, instructing their wire chief to be continually on guard for low insulation, unbalanced conditions, noisy circuits and crosstalk.

In our zeal for the best in toll line construction, we are liable to neglect, to some extent at least, the subscriber's loop. A long distance connection, be it ever so perfect, would be more or less unsatisfactory if the subscriber were to use an old or obsolete type of telephone, or if the telephone were improperly wired, or was not equipped with the right type of receiver, induction coil, or transmitter.

Probably in no other branch of the electrical industry are there so many diversified methods of wiring and circuits as in telephony. It is not such a difficult task to repair a telephone, switchboard or any other piece of telephone apparatus; the difficulty usually lies in locating the trouble. Let us take, for example, the common battery induction coil type of telephone. There are six different ways in which this instrument can be wired, and yet work more or less satisfactorily.

On long subscribers' loops the induction coil type of common battery telephone should always be wired as in Fig. 1-A. For short subscribers' loops the circuit shown in Fig. 1-B is permissible for satisfactory transmission; and it is also recognized as the circuit used to reduce side tone. This change is made in the late type of instruments manufactured for Independent telephone companies by a stranded jumper wire with spade tip that can be changed easily to the proper terminal for side tone reduction on a short loop as in Fig. 1-B, or for the long loop as in Fig. 1-A.

Figs. 1-C, 1-D, 1-E, and 1-F, are some arrangements that can be used or some arrangements that you might find if the telephone looks as though it had been "rebuilt" by none too competent repairmen. None of them will excel the circuits shown in Figs. 1-A and 1-B, however.

A few things worth remembering in clearing trouble on common battery induction type circuits are: Reversed primary and secondary windings, transmission reduced about 50 per cent; high resistance transmitter, a marked reduction in the receiving qualities of the telephone; reversal of one winding of the induction coil

in relation to the other will affect the transmission, but not the receiving qualities of the instrument. A receiver of approximately 60 to 70 ohms' resistance should be used on all common battery induction coil type instruments.

In addition to the induction coil type circuit, there are two other telephone circuits used a great deal in the Independent field: the common battery telephone with retardation coil and condenser; and the "balanced bridge" type of instrument, illustrated in Figs. 2 and 3.

The retardation coil and condenser type circuit employs a low wound coil (usually 18 ohms) of high impedance in the transmitter circuit, and a ½ M. F. condenser in series with the receiver circuit. With this type circuit it is possible to use a rather high-wound receiver of 100 to 125 ohms as it is entirely separate from the transmitter circuit.

Many exchanges have a number of the older type receivers which they have reclaimed or rebuilt from old instruments. While the retardation coil and condenser type of telephone will operate just as satisfactorily with a receiver of 60 to 70 ohms as with a receiver of 100 ohms or more, this is the only type circuit in which the higher-wound receivers should be placed to maintain a higher degree of transmission efficiency. If there are high-wound receivers in the plant, the shop should inform the troublemen and mark the receivers in some manner, by painting the "cup" or a portion of the magnets a bright color. The troubleman then may easily check the receiver equipment on any station by removing the shell of the receiver.

The balanced bridge coil type of circuit represents a majority of the telephones in service today that were manufactured by the old Dean Electric Co. for common battery service. This circuit employs the principle of the balanced Wheatstone bridge to keep the flow of direct current from the receiver, while voice currents which are alternating in effect, are forced through the receiver by means of retardation coils placed in the arms of the bridge. Fig. 3-A shows the circuit arrangement. In the telephone, however, all four windings are on one spool and resemble in appearance any standard common battery induction coil.

The resistance of the windings, *A* and *B*, are 20 ohms each, while windings *C* and *D* are 30 ohms each. *A*:*B*::*C*:*D* would be a balanced equation. Therefore, no direct current would flow between terminals 2 and 3 or through the receiver, but would take the path indicated by the single pointed arrows in Fig 3-B. The retardation coils, *A* and *D*, force the voice current in the paths indicated by the double pointed arrows or through the receiver. The receiver in this circuit would correspond to the galvanometer in the Wheatstone bridge testing circuit.

The resistance of the two non-inductive windings, *B* and *C*, are in series with the receiver or approximately 50 ohms. This small loss in the receiving circuit is offset

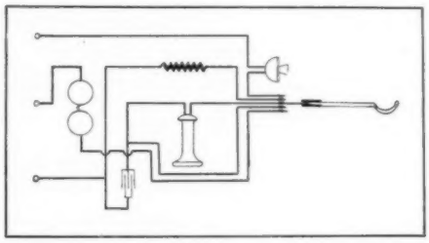


Fig. 2. Circuit of Common Battery Telephone With Retardation Coil and Condenser.

by the fact that otherwise the receiver is in the line circuit direct, there being no condenser in the talking circuit of this telephone. The receiver is, therefore, in position to receive the maximum incoming voice current without loss or distortion.

The transmitter current comes through all four coils of the bridge, the resistance of which would be only 25 ohms. Therefore, the transmitter would receive the full amount of direct current supplied the instrument from the line and central office equipment. While this telephone does not have the "booster" qualities of later type instruments, it is free from side tone; and on long distance calls the subscriber may hold the receiver tightly to the ear without any deafening effects. Another advantage would be the absence of a condenser in the receiver circuit which produces voice current losses in proportion to its electrostatic capacity.

While the smaller Independent companies cannot adopt the zoning plan for their different type instruments as do the larger companies using small gauge cables, they can, in a way, render a more uniform degree of transmission over the entire plant by observing a few simple practices of the zoning system.

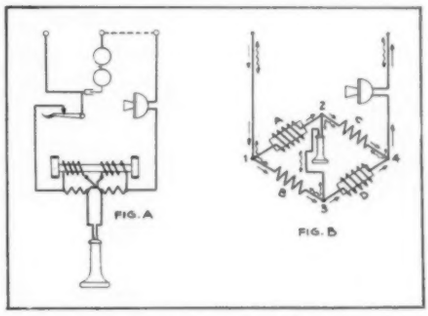


Fig. 3. The "Balanced Bridge" Form of Telephone Set Circuit.

You will find in many plants the new and late type circuit telephones on subscribers' short loops near the office, the older instruments on loops in the residential section of the city or on common battery farm lines just outside the city limits. The theory for this has been that the business houses, usually located near the telephone office, are the large users of toll service and, therefore, deserving of the very best in late type instruments.

On a plant with which the writer had some experience a few years ago, the reversal of this idea was given a trial. All four and eight-party rural common battery lines were equipped with new telephones. The instruments in town were rebuilt and refinished telephones. Subscribers soon found that they could talk long distance over their telephone located a few miles in the country as satisfactorily as from a telephone booth in the office.

An increased volume of toll traffic was attributed to this plan as the service was made available and more satisfactory any time the subscriber cared to use it. With but few exceptions, the older instruments in town were satisfactory. They being on short loops, were supplied with a more even battery potential than would be possible in rural line practice. These instruments being close to the central office were more easily inspected and maintained than would have been possible if they were located in the country.

To eliminate transmission failures on rural common battery lines several miles in length, some experimenting may be done by any plant with "L-C" transmitters in place of the ordinary "C" type, particularly the instruments farthest out on the line, where the potential drop is noticeable.

The method for determining whether a change in type of transmitter is necessary must be chosen somewhat from experiment. For example, a common battery cord circuit operating from 24 volts supplies a potential of 21 volts to an instrument on a very short loop. Removing the receiver and testing the voltage across the

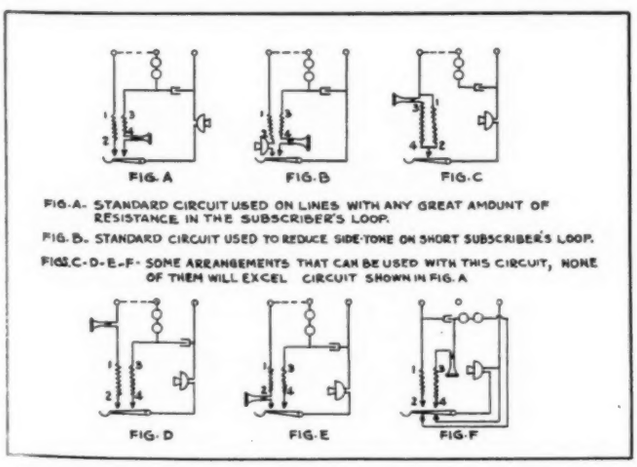


FIG. A
FIG. B
FIG. C
FIG. A- STANDARD CIRCUIT USED ON LINES WITH ANY GREAT AMOUNT OF RESISTANCE IN THE SUBSCRIBER'S LOOP.
FIG. B- STANDARD CIRCUIT USED TO REDUCE SIDE-TONE ON SHORT SUBSCRIBER'S LOOP.
FIGS. C-D-E-F- SOME ARRANGEMENTS THAT CAN BE USED WITH THIS CIRCUIT, NONE OF THEM WILL EXCEL CIRCUIT SHOWN IN FIG. A
FIG. D
FIG. E
FIG. F

Fig. 1. Six Methods of Wiring Common Battery Induction Coil Type Telephones.

terminals of the telephone, there will be another drop in voltage to about 8 or 10 volts. These figures are only approximate as the type of instruments and circuits will vary somewhat.

The troubleman will then drive the line, making a test from each instrument with receiver off hook and battery being supplied from the cord circuit. The farther out on the line, the greater will be the drop in voltage, and below 4½ volts the troubleman will make a change in transmitters from the standard "C" transmitter to the "L-C" type. Below three volts it is doubtful if the telephone will operate satisfactory, and a change would probably be necessary to magneto equipment. The foregoing test should be made with a voltmeter of high resistance (5,000 ohms), for it can be connected to the terminals of the telephone in preparation for the test, without causing the line to go permanent.

Not all the cases of instrument trouble that the troubleman will be required to repair are transmission troubles. From time to time the signal equipment will require inspection, adjustment and repair. The ordinary "bridging" 1,600 to 2,500 ohm ringers or the "straight-line" 500 to 1,000-ohm ringers are easily understood. They require few tools for adjusting and can be placed in order in a few minutes at the subscriber's station.

Frequency ringers, however, present slightly different problems. And in addition to obtaining a proper adjustment of the ringer at the subscriber's station, the voltage and frequency of the vibrators in the central office should be inspected at frequent intervals.

The larger offices may be in possession of an alternating current voltmeter of

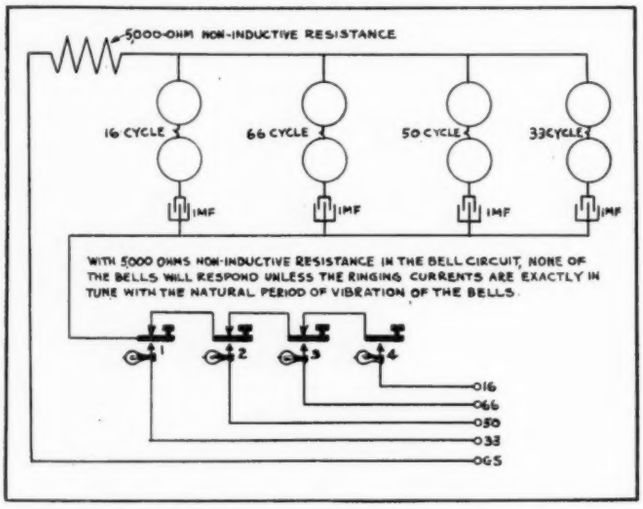


Fig. 4. Arrangement for Testing and Adjusting Frequencies of Harmonic Converter.

5,000 ohms' resistance (Weston Model 155 or similar model) together with a frequency meter of the rotary-pawl principle; or they may have mounted on the power board, frequency meters on the principle of the vibrating reed which are somewhat less expensive. However, the smaller offices may feel that they cannot afford the necessary expenditure for these instruments and, therefore, hesitate in installing selective ringing equipment; or they worry along with selective ringing equipment already in service, making several unsatisfactory adjustments on telephones and converters before getting ringers and converter synchronized.

Providing there is no alternating current voltmeter at hand with a high internal resistance for testing the voltage output of the converter, satisfactory results may be obtained with the use of a 24-volt switchboard lamp in series with the proper non-inductive resistances for the different frequencies. Fig. 5 illustrates a method of wiring voltage testing apparatus; the 33-cycle requiring a non-inductive resistance of 750 ohms; the 50, 66 and 16-cycle ringers requiring non-inductive resistances of 1,050, 1,450 and 550 ohms respectively.

Pressing the key to any particular frequency places the non-inductive coil of that frequency in series with the switchboard lamp and the terminals of the converter. The lamp burning at full brilliancy indicates that the voltage is satisfactory for that particular frequency.

If the lamp should fail to light up to full brilliancy, then the indication would be that the battery voltage operating the converter is below normal; or that the 110-volt lamps, which are in the generator leads for protection to the converter vibrators, are of the wrong type or too high or too low as regards lamp watt consumption. Substituting a 25-watt, 110-volt lamp for a 15-watt, 110-volt lamp in the generator leads will increase the voltage on any of the four frequencies by about 15 volts.

Some experimenting along this line on the particular make of converter in the exchange may remedy some of the ringing troubles. There is danger of getting the voltage too high, however. Cross ringing, breaking down of insulation in the ringing keys, and possibly the puncture of cable pairs would be an indication of too high a voltage output on the converter.

Harmonic ringers are designed to operate at about 60 volts. The voltage at the terminals of the converter will be almost twice this amount to take care of line loss, the number of ringers bridged across the line, etc. Following is a table of voltages at the converter (no load) with four telephones across the line or one of each

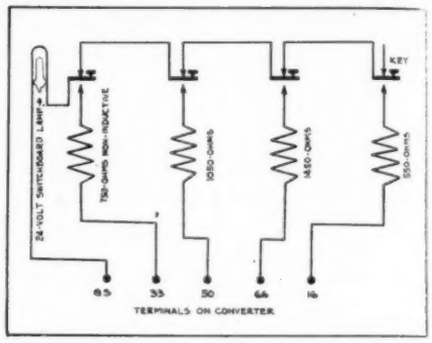


Fig. 5. Wiring of Apparatus for Testing Voltage Output of Converter.

frequency, a condition corresponding to a four-party selective common battery line. This table does not compute any line loss.

No load 33-cycle—130 volts.
No load 50-cycle—125 volts.
No load 66-cycle—121 volts.
No load 16-cycle—124 volts.

With four ringers on the line, one of each frequency:

33-cycle, 500-ohm ringer—91 volts.
50-cycle, 500-ohm ringer—95 volts.
66-cycle, 500-ohm ringer—95 volts.
16-cycle, 2500-ohm ringer—97 volts.

The manufacturer of any particular make of equipment will have this voltage information on file and can furnish a copy to the exchange where there seems to be some doubt as to the output of the machine. The table given is for the Kellogg No. 6 converter only.

If no frequency meter is available for testing and adjusting the frequencies of the converter, a set of four accurately tuned harmonic bells, wired as in Fig. 4, will serve for all ordinary purposes of adjusting. A great deal in this scheme depends on the four ringers being accurately tuned to their corresponding frequencies as they must perform the duties of a regular frequency meter.

In some instances where the plant has had considerable ringing trouble, it may be necessary to send to the manufacturer for four new ringers, one for each frequency, namely 33⅓, 50, 66⅔ and 16⅔ cycles. This testing device may be mounted on any rigid support and as close to the vibrators as convenient in order to save time and steps in testing and adjusting. Condensers of 1 m. f. capacity in series with each bell, a 5,000-ohm non-inductive resistance placed in the circuit as per the illustration, and four break-and-make contact keys complete the material necessary.

In testing, if it is found that any of the ringers do not give a good clear ring when current is applied by means of the key, then that frequency is running at an improper speed. If upon touching the clapper of the bell, it will ring or at least vibrate, that frequency is too fast. And if the bell does not ring or even vibrate, the frequency is too slow. The speed of the converter vibrators may then be adjusted by means of the weights on their armatures.

Raising the weight increases the frequency, while lowering the weight decreases the frequency.

Before attempting any adjustment it is advisable to mark the original adjustment of the weights in order that the original frequency may be obtained if no better speed is found to synchronize with testing equipment. Move the weights only a very short distance and then test. This may take a number of trials but will be quicker than by moving the weight a quarter of an inch or so to start with.

After making a thorough check of the ringing equipment in the office, the troubleman may go to the subscriber's station with some assurance that once the ringer is adjusted in the telephone, it will stay in adjustment with the central office equipment for some time to come.

While these remarks will not necessarily be of benefit to the maintenance men of the larger plants where supervision in each department is forthcoming and where every available type of transmission and signal testing instruments is in use, the writer believes that a resumé of telephone instruments and circuits will be of some benefit at least to the troubleman; especially to new men assigned to this work or men cutting over from magneto to common battery plants.

The subscriber forms to some extent his or her opinion of the telephone plant as a whole, by the condition of his own telephone. If this instrument is rendering an unsatisfactory grade of service, an opinion may be formed by the patron that the whole plant is in more or less of a run-down condition.

No matter how well constructed a telephone plant, there will always be trouble. And as each and every telephone has some 200 piece parts, the instrument will cause its share of this trouble. Theory together with a practical knowledge of the instrument will assist any troubleman in this work. The "kinks" herein described may throw a little light on a few cases of trouble that the plant man has been having and thus speed up his work.

New Uses for Stockholders and Their Interest in Company.

Several heads of corporations have discovered that the stockholder is good for something besides holding stock. He can, they have ascertained, aid in selling the products of the corporation, and hundreds of letters have gone out since the first of the year to stockholders of various corporations urging that they purchase "our own products" and that they also encourage their friends and relatives to do so.

Oil companies, food concerns, candy manufacturers, cigar and cigarette makers, clothing manufacturers and corporations engaged in varied other lines, with large stockholders' lists, are engaged in these campaigns. In the railroad field, both the New York Central and Pennsylvania have urged their stockholders, in personal letters, to make extensive use of their own property.

Walter S. Gifford, president of the American Telephone & Telegraph Co., tells of the manager of one of the Bell exchanges receiving a letter from a woman stockholder with the information that workmen repairing a cable in front of her house had failed to remove a good-sized roll of spare cable when the job had been completed.

"That's our cable and must be valuable to us," reported the stockholder. The information was found on investigation to be true and "our cable" was recovered. The stockholder received a letter of thanks.

Great Britain's Public Call Facilities in Rural Districts.

The British postmaster-general states that at the end of September, 1929, some 44 per cent of the rural post offices and railway stations in Great Britain were without public telephone call facilities, while in Northern Ireland the proportion was 69 per cent.

Arrangements have, however, been made to provide such facilities in a number of localities, and further extensions are under consideration. Within the past six months, 120 call offices have either been established or authorized in Northern Ireland.

Announcement

"Telephony's" Annual Prize Article Contest

Telephone people are more interested than ever before in their work and in making telephone service more and more satisfactory and really indispensable to the public. How this is being done can only be told by the men and women engaged in the work.

"Telephony's" prize article contest offers special incentive to the many telephone workers to write articles concerning the practical phases of their work which may help others better to perform their daily tasks in the telephone field.

Many interesting, instructive, informative articles concerning plant, traffic, commercial and executive phases of the industry, have been published in "Telephony" in the past few years, but telephone work is ever-changing, and interesting discussions are always heard whenever telephone people gather together.

What would you talk about when meeting another engaged in your particular branch of work? Write down your thoughts, and submit them in "Telephony's" prize contest. The prizes are:

General or Executive Articles		Plant or Construction Articles		Traffic or Operating Articles		Commercial or Business Articles	
First prize	$75.00	First prize	$75.00	First prize	$75.00	First prize	$75.00
Second prize	45.00	Second prize	45.00	Second prize	45.00	Second prize	45.00
Third prize	30.00	Third prize	30.00	Third prize	30.00	Third prize	30.00

Articles submitted should be typewritten, on one side of sheet only, and double spaced. Photographs, pencil sketches or diagrams help to illustrate articles and make them more interesting. About 1,800 to 3,600 words are usually sufficient to tell the essential points and details of a story.

Articles which do not take prizes will be considered for publication in "Telephony" at the regular rates for contributions. More than one article may be submitted by a writer.

Contest closes March 24, 1930, and is open to telephone people only.

Stanley R Edwards

Editor

Problem of Discipline and Harmony

How to Maintain Operating Discipline and at the Same Time Promote Harmony Is One of Most Difficult Problems Chief Operators Have to Face—Some Helpful Suggestions—Paper Read at Traffic Meeting of Ohio Convention

By Mrs. Trevelle Jones,
Chief Operator, Lima Telephone & Tele graph Co., Lima, Ohio

It is easy enough to have discipline, for discipline can be forced; but to have discipline and at the same time promote harmony is quite a different problem. It is one of the most important problems that chief operators and supervisors have to face.

Discipline and Harmony.

First, let us see what we mean by discipline: Systematic training, or subjection to authority; to train to obedience. Discipline being one of the fundamentals of our work, it is well to take an inventory of ourselves as leaders, for that is what we are in our small part of this great organization.

To get respect, one must give respect. The leader who wants respect from others must have self-respect, for if we do not believe in ourselves, we cannot expect others to have faith in us.

Respect breeds respect, so the first point in maintaining discipline is to have confidence in our girls. To show confidence in them, and vice versa, must mean discipline, and I can see no other outcome but harmony.

Now what is harmony? Harmony is accord in feeling, manner or action; when thoughts or feelings, individually different, form a consistent and pleasing whole. Harmony, however, is deeper and more essential than agreement.

It seems that supervisors or department managers are awakening to the fact that the means of getting the best results from workers is not by the lash, hard words, black looks or heartless neglect, but kind words of encouragement, confidence and pleasant smiles. The smallest worker has a place to fill, and she is going to fill it; not through force and threats, but by mutual understanding.

Obtaining Good Will of Workers.

Undoubtedly one of the greatest influences for harmony is the ability to secure and hold the good will of the workers, and this can't be done by playing favorites. If you find you dislike a girl for personal reasons, make a special effort to do something nice for her, or to show some appreciation of her efforts; but if it is their lack of efficiency, then talk to them and correct them and try to help as far as you think advisable.

To avoid partiality we must treat all alike. In being partial to the ones we like we are not only losing their respect but we are also weakening their character. Remember, they will work harder and think more of us if we give them just what they are entitled.

Treat all alike. Before granting any special favor to a favorite, such as a pleasing job or an advance in work, or some such thing, consider whether you would do the same for one not held in your special favor. Nip in the bud every attempt to take advantage of proffered kindliness; if necessary, even to the extent of refusing to grant them any more favors for the time being.

Stop at the point of justice in meting out favors. Never give more than is coming to them, for they will submit to stern treatment if everyone is treated alike. So by tolerance and working in the interest of each operator you can show your good will and be kept from being considered soft and easy by sudden and extreme harshness when you are imposed upon by limiting the extent to which you grant favors.

Promotion of Discipline.

One way of making strictness easy is to avoid getting under obligation to anyone; also do not become too intimate with the girls over whom you supervise. It is much easier to discipline girls you meet only in a business way. It has been suggested by some to never call a girl by first name, but "Miss Black," etc.

Familiarity breeds contempt, but courteous treatment with a proper degree of personal warmth will win anyone. So one of the things we must try to do is to recognize prejudices and try to overcome dislikes that rest on a personal basis. When favoritism is shown, the reason should be the employe's conduct and loyalty and not personal prejudices.

When a favor is asked, grant it if possible, for you may want a favor from them. When they ask if they can be off on a Sunday, and that seems to be the day they dislike to work the most, I tell them if they can get someone to work for them it will be all right. Tell them to find someone of the girls who is willing to work. By letting them get someone to change they are given a sense of responsibility, and sometimes it's no easy task to get a substitute. If they cannot get someone, they do not feel so badly and don't feel that you haven't tried to help them.

However, if they fail to get someone I usually see if I can arrange it so they can have the time off. I also do this when they want to change hours. Some chief operators will not allow girls to change hours on Sundays, but if we expect to keep their good will we have to grant a few favors, so long as it does not affect the service.

This all keeps a girl in a more harmonious state of mind. I find, when circumstances demand, that I can always depend on the girls to do their part. They feel that service is first, and if we do not have the elements of service within us we are failures.

Selection of Assistants.

In choosing assistants, everything being equal, of course the first choice should be for the older girls. However, the younger girls should be given a chance to learn other parts of the work besides the operating. Often times the younger girls show more interest and can give very good suggestions; besides, in changing around it keeps them more interested.

The three main duties of a chief operator could be summarized this way: To organize, to deputize, and to supervise. To organize your force, to deputize your helpers, and put them where they can work to the best advantage; supervise the work and see that the work is carried on efficiently.

Good leaders never waste time on details but delegate them to someone under them. The leader is concerned only with results, and receives credit for the capable performance of the undertaking or censure for the failure. When we organize our force we must stand back of it. If they fail, do not censure them too much, for we are partly to blame for not choosing the right person for the place. Do not shift the blame on someone else.

Encouragement and Praise.

Give a word of encouragement and praise occasionally when deserved, for everyone is alike in this—they like to be considered a person of importance in the eyes of someone else. Good will in the full sense of the word is possible only through the proper attitude of the company towards its workers, which means, in our case, the chief operator and supervisor toward them. In fact the chief operator and supervisor is often the only contact point of the company with its employes.

The attitude of the company may originate and develop from the attitude of the supervisor. This attitude must necessarily be honest, but it must be more than that; it must be fair and just.

The leader who expects to have the faith of the workers must be able to control her temper. An ungoverned temper is like fire that burns and destroys everything with which it comes in contact. People fear it; and like everything they fear, they hate it. The person who allows himself to fly into a rage, even under provocation, cannot be respected.

By becoming angry you confess you are weaker than the circumstances which irritate you, and it prevents you from accomplishing your purpose. You cannot control others until you learn to control yourself. Character will gain men's confidence but not necessarily their good will. Character needs the supplement of amiability if you are to build your organization of discipline and harmony.

It is stated that 97½ per cent of efficiency of any plant lies in the workers and 2½ per cent in the equipment that makes up the plant. So we must be very careful in selecting our operators. When one person out of every ten estimates a person's character by clothes, it is just as well to put up a good appearance. Appearances are deceitful but the persons who make their clothes count for them instead of against them are persons who make the most of their opportunities.

Statistics show that the majority of average conscientious business people, both men and women, do not as a rule go home at night genuinely tired, and that their business bores them rather than interests them. If this is the case, then maybe we are to blame for their lack of interest. Could we make it a more interesting, pleasing and harmonious place to work?

It has been suggested by different organizations that workers have some share in the company and let them share in the profits, and also feel the loss when business is poor. This might simulate a more personal interest.

All this goes to add to good will or harmony. Another way you can show your interest in them is to let them see you are working for their interest. If need be, go to your superior and ask for favors for operators; maybe something in the operating room to make things more comfortable or pleasing, or in the restroom, where they spend their relief period.

We know it takes the combined efforts of every one of us—those holding the big positions and those holding the minor ones—to make this organization we represent. It should be our business to develop the personality of our girls, for that means individuality, originality and progress.

There is no royal road to good will, unless it is on the basis of deserving it. Open-mindedness is one of the roads. Be open for suggestions or advice, even if it comes from one of the workers under you. Tact is another. Willingness to look at things from other viewpoints is the very essence of tact.

Man has been defined as a servant; and if you take service out of life you have nothing left. So with this in view, we are all serving one another and we might be governed by this rule: "Whatsoever ye would that men do to you, do ye even so to them."

If we can show this rule by our work, then we possess character and are in accord with feelings of others, which are the virtues of cooperation or harmony.

Dealing With Operating Problems

The "Stop, Look and Listen" Signal in Dealing With Problems of Operating Practice, Such as When Hiring New Operators; When Operating Load Is Changing; Service Complaints, Etc.—Paper From Traffic Meeting of Ohio Convention

By A. C. Stuart,

Traffic and Equipment Engineer, The Utilities Service Co., Lima, Ohio

When we approach a railroad crossing, we see a red light flashing to warn us of an approaching train. If we fail to heed that signal, we must take the consequences. Just so in our operating problems; we have certain signals and signs which warn us that it is time for us to check up and make some changes in our operating practice, or call attention to irregularities that are continually creeping in, due in some cases to new employes or to the old employes getting careless.

I wonder if we all "Stop, Look and Listen" when we hire new operators for the force. Do we consider carefully their general appearance, their character, their general health and attitude for the work, which may be shown in some degree by simple, intelligent tests. A great many times these tests show that the applicant is not adapted for telephone work at all, but would be all right in some other line of work.

After we hire them, I wonder if we watch their training as closely as we should, to see that they do not form bad operating habits, which are not easily broken. If you sit a new girl at the board and let her learn through the hard knocks of experience, she may or may not come through a good operator; but if you sit down and take the time to show her just how to handle a plug and cord, and how she should conduct herself at the board, she will start out right by operating in the correct way. She will not have to show her ignorance to her colleague, because her instructor understands she is a new girl and will show her every detail of the work. This is true in both local and toll operating.

Again I wonder if we "Stop, Look and Listen" when our operating load is changing, especially in the spring and fall when the days lengthen and again shorten. When the service slows down and our operators report being very busy at certain times in the day, do we just add another operator, or do we take a peg count to find out just what load we are carrying, what time of the day we are busy, and where adjustments should be made?

In most cases we will find it is just a shifting of the load from one part of the day to another. For instance, in the summer time people get up earlier in the morning; they are starting on automobile trips, picnics, etc. Therefore, it is necessary to have more girls on duty earlier in the day during the summer than in the winter time. Again, the shifting from slow to fast time is a factor that must be considered in adjusting operators' schedules.

A quick way to find out if your operating load is properly adjusted is to take a three-day peg count by the hour, including a Monday or a Friday, but do not include Saturday, as this is not a representative day. And I might say that in making the peg count, great care should be taken to see that every operation the operator makes is recorded, such as giving the time of day, answering a party who claimed his bell rang and no one was on the line; in fact, all calls where the operator talks to the subscriber and receives a reply, should be recorded on the peg count.

After you have taken a three-day peg count, average each hour or half-hour by dividing the total calls handled each hour for three days by three. This will give you the average each hour. If you are using a straight common battery multiple board, divide the busy hour by 245. This will give you the number of operators required for that hour. Divide the other hours of the day by 230; this will give you a general idea of the number of operators required each hour of the day.

Of course, the scientific way of doing it would be to consider the operator's length of service, the number of units handled

per operator, per hour, based on previous study, and a percentage of each hour's load to the busy-hour load, and then arrive at the number of units each operator should handle per hour. If you are operating a feature board it will, of course, be necessary for you to find out the average number of calls your operators handle per hour and the average work unit per call, before you can work out a proper working schedule.

It should always be kept in mind in figuring schedules that a less number of calls or units can be handled per operator during a light load than at full load. That is, during the early morning and late evening when only one or two operators are on duty, less calls can be handled per operator than when there are 10 or 12 operators working at the busy hour.

I wonder if we are always inclined to "Stop, Look and Listen" when an irrational subscriber complains of poor service. Do we put ourselves in their shoes and look at the complaint from their standpoint? This is where our danger signal should be especially heeded. Even though we think the complaint is not justifiable, we must use every effort, and exhaust every avenue, to convince this patron that we will remedy and make every effort to clear his trouble. I am speaking of chronic or overly-vexed telephone subscribers who have complained repeatedly of the same or similar trouble.

What about our long distance calls—do we make every effort to complete as large a percentage of the toll calls offered as possible? Do we impress upon our toll operators that it is essential that every effort should be made to complete a toll call at once where the subscriber has a limited amount of time to wait and has advised us of that fact?

These are all danger signals and may be the means of making you very happy or of causing you a great deal of worry. It is only the completed toll call that makes your company any money; and, after all, dollars and cents are what count.

How about new methods and changes? Are we keeping up with the betterments in service continually being made by the larger companies? Do we try to apply these to our own office, so as to be up to date on the latest operating practice? If we don't we should wake up and look around.

In the final analysis, if we just keep on going in the same old rut and fail to "Stop, Look and Listen," or check up now and then, we may find ourselves run over by the wheels of progress and our company suffering from "rutitus," which not only affects the revenue of our company but our pay checks as well.

Answers to Telephone Calls Results in Operator's Conversion.

The bulletin of a Lutheran church in Pennsylvania on a recent Sunday contained a little story that will interest telephone people, particularly operators. It was sent in by C. E. Eaby, manager of the Denver & Ephrata Telephone & Telegraph Co., Ephrata, Pa., and reads:

The family altar has a story of an unusual conversion. A young woman came before the session of a church and said she wished to unite with that church. No one present knew her; she made an unusually clear confession of faith, impressing the minister so much that he asked her how she had been led to Christ.

"Through Dr. S." she replied.

"Is Dr. S. a friend of yours?" she was asked.

"No," she said, "I have never met nor even seen him."

She was a telephone operator, and had had night service, from 9 p. m. to 3 a. m. Receiving many calls for this physician, Dr. S., she had more than once rung his bell by mistake.

Always he answered, not only with courtesy, but in a voice that showed no trace of impatience. It was such a grateful relief from the surly, sleepy voices of others awakened at midnight, or the harsh expressions directed at her when she rang a wrong number by mistake, that she finally became deeply interested and wanted to know the secret of the difference between Dr. S. and other men.

She made inquiries about him, and she learned that Christ was supreme in his heart and life, and that what she was so admiring in him was simply Christ living in an earnest Christian. Soon Dr. S.'s Saviour was her Saviour. Herein is a suggestion for those who have telephones and are sometimes annoyed by untimely calls.

Be Sure You Are Right—Then Go Ahead.

By Mrs. Mayme Workman,
Traffic Supervisor, Illinois Telephone Association.

"Hans" and "August" crossed the ocean on the same boat, to seek their fortunes in America, the "Land of Promise." Quite a number of years later we find Hans running a grocery and meat market, and August a shoe repair shop.

It was in the days when it was customary to have a "raffle" before the holidays. A large crowd had gathered in Hans' shop, among them his old friend August. Hans is having his customary pre-Thanksgiving raffle. Everything has been disposed of but the geese. Hans makes this announcement: "Now we will raffle off de Gooses." August, in the back of the store, says: "Ha, ha, ha, in dis country forty years, and he still says, 'gooses' for 'geeses.'"

To those working in a supervisory capacity I would say: "Never make a correction unless you are sure you are right." If you make a correction and you are wrong, there are two evils to overcome instead of one. A wrong correction is worse than no correction at all.

If an operator asks you a question regarding an operating practice and there is a doubt in your mind as to which is the correct procedure to follow, tell her quite frankly that you are not sure of the correct method of handling the call, but that you will find out and let her know. If you are not in a position to find out at once, make a memorandum of the request and secure the information at the first opportunity—and be sure to give it to the operator requesting it.

While it is expected of those in supervisory capacity to be familiar with the operating practices, changes are made in these practices from time to time, making it possible to become confused with the old and the new method. So there need be no embarrassment in admitting that you are unable to answer a question put to you by an operator. It will not cause you to lose prestige with the operating force; on the contrary, it will inspire confidence. The operators will feel satisfied that any information they receive from you will be correct.

Never, as I have heard operators remark, let it be said of you: "Oh, what is the use of asking her anything, she will only tell you the wrong thing. I asked her yesterday what the subsequent attempt time on an 'ext by,' report was and she told me, 'Ten minutes.'" Another operator spoke up and said: "When I want to know anything, I always ask Miss Black. If she does not know, she will look it up for you, and she always comes back and tells you, and you can depend upon the information being correct."

To be a successful supervisor, you must have the respect and confidence of the operating force. So, "be sure you are right—then go ahead."

Newfoundland Grants Bell Rights to Land Four Cables.

The Newfoundland legislature passed a bill in its 1929 session granting rights to the American Telephone & Telegraph Co. to lay four submarine telephone cables for a new system that will connect the United States and Europe. The company has been given rights to erect shore stations and landing places. Its engineers, during the autumn months of 1929, were engaged in preliminary work on the project.

Indiana Telephone Association Officers Are Elected.

Officers for one year were elected at a recent meeting in Indianapolis of the board of directors of the Indiana Telephone Association.

Henry Barnhart, Rochester, was elected president. Other officers are: R. V. Achatz, Aurora, first vice-president; Samuel Tomlinson, Plymouth, second vice-president, and W. H. Beck, Indianapolis, secretary and treasurer.

Evolution of Call-Indicator System

Apparatus Developed to Assist Operators During Time of Changing From Manual to Dial Operation—Development Undergone by Circuits and Equipment Used Since First Experimental Call—Recent Improvements Made in System

By E. H. Clark,
Member of the Technical Staff, Bell Telephone Laboratories

In changing from manual to dial operation there is usually a period, which in the larger cities may be of considerable duration, during which both manual and dial offices will be in use. When this situation exists, calls are originated in an office of either type, to be completed in one or the other. Among other things, therefore, equipment must be provided at the manual office to indicate to the operators the numbers dialed to their office for completion.

Apparatus developed to accomplish this—a group of numerals which light up to indicate the number wanted—is known as a call indicator. The circuits and equipment used have, like the rest of the dial system, undergone a large amount of development since the first experimental call indicator was installed in the Cortlandt office, New York City, in 1910.

The revertive pulsing method, used for selecting numbers wanted in dial offices of the panel type, was also employed in the first call-indicator system. Power-driven sequence switches at the manual office were utilized to return pulses to the subscriber's sender, much as the selector commutators do on calls completed in a dial office. Six of these sequence switches, one for each of the possible digits and letters of a number called, constituted a complete register.

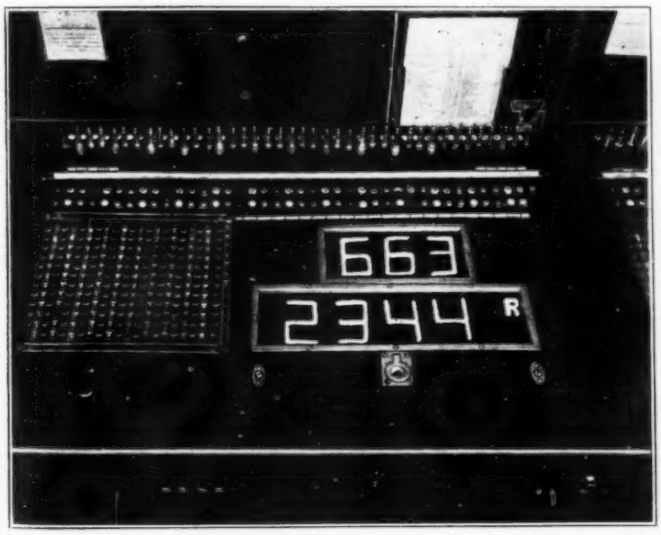
The time required to completely record the number was about five seconds on the average. If but one such register were provided, this recording time of five seconds would seriously affect the number of calls that an operator could handle, so that several of them were furnished for each call-indicator position.

When a number had been completely recorded on a register, the operator was given an indication by the lighting of an assignment lamp associated with the plug of the trunk over which the call was coming, and the number recorded was displayed on her indicator. The time required to transfer the record from the sequence switch to the call indicator was so short that there was no appreciable delay in operating.

When the plug was inserted in the jack of the line called, the register would release and the number would disappear from the call indicator. Both the register and the call indicator were then ready for another call; and if one were waiting on another register, it would be immediately displayed on the call indicator.

Although this method was very satisfactory, it required power-driven equipment at the manual office, which it was desired to eliminate. This is accomplished by using relay registers which were operated by pulses transmitted by the sender. A faster pulsing method was also developed which made it possible to use only one recording device for each call indicator, the operator receiving the numbers directly from the senders at the calling office.

This method is called the relay call-indicator system because only relays are used at the call-indicator positions to record the number wanted. The first plan developed was based upon a system of ground return pulses. This method was not adopted, however, because of the disadvantage of the high potential that would be necessary to overcome earth potentials. A metallic signaling method was developed instead which was capable of transmitting signals at the required speed.



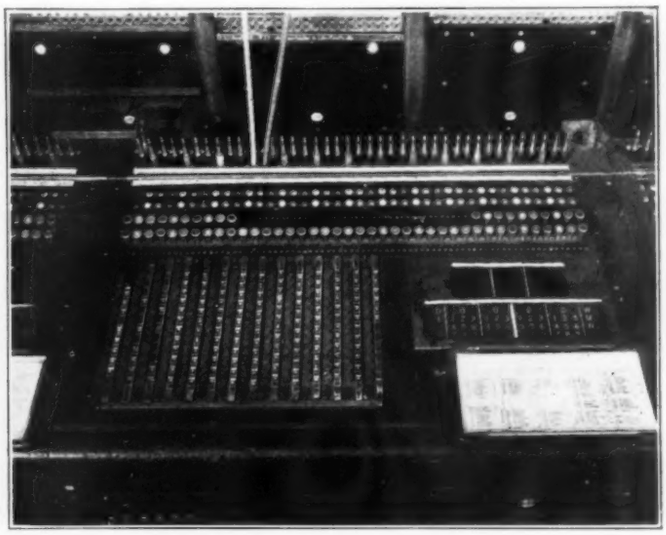


Fig. 1. When Used in a "Tandem" Position a Second Call Indicator With Only Three Digits Is Required to Display the Number for the Office Code.—Fig. 2. With the Call Indicator of the Relay Type Only a Single Lamp Is Lighted Before the Switchboard Operator for Each Digit of the Number Called.

Even with the faster method of pulsing, an overlapping method of operating was necessary to prevent a drag on the operator. With this method an operator picks up the proper plug when the number is first displayed and then presses a display key for the next number. While she is inserting the plug into the desired line, the next number is being displayed. If no call were waiting, the insertion of her plug would extinguish the number displayed.

The call indicators used with the first system, installed in Cortlandt office, New York City, in 1910, and in Newark, N. J., in 1914, made use of universal figures similar to the carriage call devices used in front of theaters, and for this reason were termed "carriage call-indicators." The arrangement is shown, installed in a keyshelf, in Fig. 1.

From two to seven lamps must be lighted for each digit. There was no particular objection to this for the early system because the contacts on the sequence switches are relatively numerous and could easily serve for selecting the required combinations of lamps.

With the relay call-indicator system, however, these contacts are not obtained so economically. A new type of indicator was developed, therefor, which used only one lamp per digit. A unit of this type is shown in Fig. 2. With this indicator, one of the digits between each of the parallel lines lights to show the number wanted.

A recent development is the automatic display type of call indicator, which displays the call automatically as soon as the operator presses a master release key. The overlapping operation on the part of the operator is retained but a master release key replaces the individual display key associated with each trunk.

This system was developed to provide certain equipment advantages, such as the simplification of its introduction in existing manual switchboards. It also provides an advantage from an operating standpoint, by requiring only one disconnect key and by making the assignment automatic, instead of by means of a display key associated with each trunk.

All the circuits described were designed for use with the panel system. Call-indicator equipment, however, was required also for the step-by-step system, the first installation of which was completed in Minneapolis in 1920.

In the step-by-step system there are no senders nor any apparatus corresponding to them in any installation in this country, so that storing the calls at the indicator becomes necessary. A number of registers are provided for each position for receiving the pulses directly from the subscriber's dials.

When a trunk to a call-indicator position is selected, a register automatically connects itself to the trunk in time to receive the first digit of the number. The call is displayed by the operator's depressing a display key, and the general method of operating is similar to that described for the relay call indicator.

Call-indicator equipment will, of course, be needed less and less as the manual offices are changed over to the dial type.

LOOKING THROUGH THE WINDOW OF THE SENSES

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

There are times when we wonder whether anything counts except Youth. The thought becomes overwhelmingly real when our attention is directed to the gorgeous displays of women's apparel in the store windows: Clothing daintily frail and exquisite; brilliantly colored; sparkling; slenderizingly youthful; slippers so daintily made that comfort-demanding feet begin to ache at the thought of wedging them into a pair of those beautiful but painful creations.

However, times are very much different from what they were 15 or 20 years ago—and we are glad. Instead of having to move on into sharply defined epochs of age and staying put, and being our age in custom, in dress, and in manner, we may remain as young as our heart's desire. And that is never very old in these days of swift, bewildering changes. Today we may hold what measure of beauty and desire we have realized without defying custom, in spite of our time of life.

We need not carry our yesterdays over into our todays, to live again our little joys, little hurts, little frets. Yesterday's joys we may store for our retrospective moods. And the little hurts and little frets, the results of some of our fumbling efforts the day before, lose their importance in the light of our todays, so full of many things. So, after all, Youth is not a certain time of life only. It is a state of mind.

One of Des Moines' old school teachers passed away recently. There was a beautiful tribute given her in our daily paper. It was written by a friend who said she had known this woman for 20 years and in all that time she had never seen her when she did not have a good-humored, friendly, courageous smile on her face.

"She had smiled her way through life and any perplexity," wrote her friend.

I did not know this teacher, but I am sure she must have had a very young heart and that she did not carry her yesterdays over into her todays, to brood and hash over.

She saw the passing of old landmarks, but she never turned back in regret or with hardened face at their giving way to newer things and newer ways. Although her body grew old her spirit remained young as in the days of her youth.

I have often wondered why the spirit should grow old and shrunken with the body; querulous and fretful against the failings of the flsh; contemptuous of all changes.

I imagine Herbert Hoover's teacher resembled that Des Moines teacher. I wonder if her fine moulding influence when he was a boy did not have an important effect on his later character.

He must have had some such thoughts when he paid her the great honor of having her attend his inauguration. He would not have done so had she become a querulous, fretful old woman.

MORAL: Some folks are like last year's oak leaves. They keep hanging on a long time after they are dead. And I imagine they keep querulously whispering to the young leaves that are trying to push their way into the light: "Don't be in such a hurry. When you have hung on as long as we have, faced storm, wind, heat, and the sting of insects, you will realize that life is not worth the struggle."

And the little leaves just pushed harder, exclaiming, "Oh, get out of our way before we push you off. You can't hold up summer (progress)."

Bell Plans for Expansion in Nebraska and South Dakota.

More than four million dollars for additional equipment and extension and betterments of facilities will be expended by the Northwestern Bell Telephone Co. in Nebraska and South Dakota alone, according to budget estimates adopted.

The management says that the demand for additional and better service is constant and increasing, and that most of this comes from toll-users. Most of the money appropriated will be spent for additions to long-distance facilities, including poles, wires and new attachments that make for better transmission. The use of toll lines increased faster in 1929 than in any other year, and officials say it is because of the new methods that make for better transmission and that enable almost instant connections and thus release lines for waiting business.

The exchanges show a similar increase, with Omaha leading the list. In Omaha, its headquarters city, the company ended the year with more than 65,000 stations, a gain of approximately 2,600, the largest in any one year in its history. The company is moving into its new 15-story addition to the headquarters building in Omaha. This cost $300,000. It gives rooms for many more offices, and has storerooms on the main floor.

Here and There in Telephone Work

The Magneto Telephone Exchange Repairman—Crosstalk.

By JOHN A. BRACKEN.

Another source of trouble in a magneto switchboard is what is known as "crosstalk." As its name indicates, it is a condition where conversation over one cord circuit in the switchboard is heard in neighboring cord circuits which normally should have no connection with it.

Crosstalk which develops in a telephone system during operation is generally due to alternations in the mechanical and electric conditions of the equipment. It can be due to either a common resistance or a contact of parts of a circuit which should not be in contact, or as a result of electro-

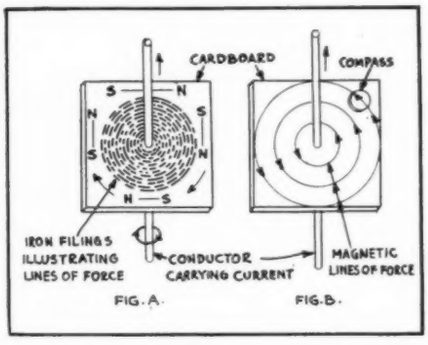


Fig. 1. Illustration of Magnetic Field Around Conductors Carrying an Electric Current.

static induction or electromagnetic induction.

Electrostatic induction may be defined as the induction of an electric charge produced in a conductor brought into an electrostatic field—that is, the region of electrostatic influence surrounding a charged body. Owing to the nature of the circuits in the magneto switchboard, the electrostatic effects may be disregarded in the consideration as to the probable cause of a trouble which it is desired to remove.

Electromagnetic induction may be defined as that capacity for induction possessed by an active electric circuit, on itself or on neighboring circuits—that is, electrical or magnetic influence without direct contact. For example, if an electrical conductor be moved in a magnetic field in such a manner that it cuts some or all of the magnetic lines of force forming that field, there will be an electromotive force induced in the conductor. If this conductor forms part of a closed electrical circuit, the electromotive force in it will produce a current. Currents produced in this way are called induced currents, and the phenomenon is termed electromagnetic induction.

There is a magnetic field around the entire length of every conductor carrying a current (Figs. 1-A and 1-B), which is composed of magnetic lines of force in the form of concentric circles. A number of circles which have the same center are called concentric circles, the plane (a plane is a flat surface) of the circle being at right angles to the conductor.

Consider the case of two adjacent parallel wires, one of which carries an electric current as shown in Fig. 2-A. As long as the current in wire *A* is constant, the lines of force surrounding the wires are steady and are, therefore, not cut by the parallel wire *B*. However, as soon as the current in wire *A* increases, the lines of force increase and expand in such a manner as to surround both *A* and *B*. In doing so, it is evident that the lines of force must be cut by the wire *B* in such a way that they tend to wrap themselves around *B* in the opposite direction as shown in Fig. 2-B.

Fig. 3 explains this action by means of the so-called right-hand rule which is for the purpose of determining the direction of the magnetic lines of force surrounding a conductor and is as follows: Grasp the conductor, Fig. 3, with the right hand so that the thumb points in the direction the current is flowing (from positive to negative sides of the circuit) then the fingers will point in the direction of the lines of magnetic force around the conductor.

In accordance with the right-hand rule, an E. M. F. will then be set up in wire *B* in a direction opposite to that of the current in wire *A*. Should the current in wire *A* decrease, the lines of force will contract, and will be cut in the opposite direction by wire *B*. They will then wind about wire *B* in the same direction that they flow around wire *A*, as shown in Fig. 2-C and an E. M. F. will be set up in wire *B* in the same direction as that of the current in wire *A*, Fig. 2-D.

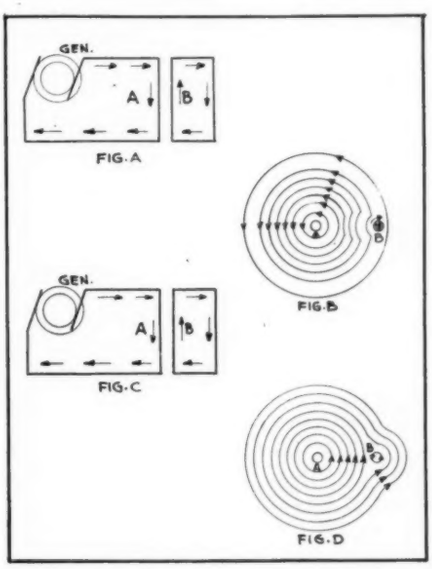


Fig. 2. Action of Lines of Force With Varying Strength of Current.

It must be remembered that the E. M. F. instead of a current is induced. The resultant current depends upon this E. M. F. and the impedance of the circuit. The resultant current in wire *B* is called an induced E. M. F. or current, and is said to be produced by mutual induction.

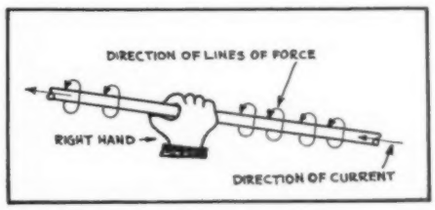


Fig. 3. Illustration of the "Right Hand" Rule for Determining the Direction of Magnetic Lines of Force.

The foregoing results may be summarized as follows: E. M. F.'s induced by an increasing current in a parallel wire are in opposite direction to that of the original current; E. M. F.'s induced by decreasing currents are in the same direction as the original current. It is evident from this law of induced E. M. F.'s that all induced E. M. F.'s must be alternating, whether produced by means of another alternating current—which, of course, is a constantly varying current—or by means of a fluctuating direct current.

Induction such as described is the cause of crosstalk on parallel wires in telephone circuits. An alternating current of high frequency, or a rapidly-varying direct current flowing through one wire in the circuit, causes an induced current in a wire of another circuit. The induced current will have the same characteristics as the original current, thus having the same effect upon the operator's telephone set receiver as that current.

Crosstalk may be caused by the inductive effect of parallel wires on adjacent parts of the switchboard equipment, such as the supervisory (clearing-out) drops, if they are not provided with metal cases. As the clearing-out drops are usually mounted side by side, and each of them is connected to a separate circuit, several of which may have electric currents of varying frequency in them at the same time, crosstalk is liable to arise owing to the current in one drop winding inducing a current in the adjoining drop winding.

To prevent this, the drop electromagnet coil is inclosed within a cylindrical iron shield or case, which serves to collect the magnetic lines of force within itself and thus prevents them from passing beyond

to neighboring drops of the switchboard.

Crosstalk can be localized by disconnecting the outside line; if it is still in evidence, the switchboard is most likely at fault somewhere.

"I Wonder Why" of an Observing Traveling Telephone Engineer.

By Ray Blain.

I wonder why so few telephone exchanges have no system about the cleaning of the equipment, especially woodwork?

This does not mean that the majority are not spotless, but the methods used to keep them so are questioned. Generally there are no dusters or dustcloths provided and the janitor, or whoever is required to keep things clean, just rustles an old shirt, BVD's, or anything that he can find handy, which usually is not of a weave suitable for picking up dirt.

Then due to the scarcity of these dustcloths, he will use one a much longer time than can be considered absolutely sanitary. I have seen a man go over a switchboard with a black, dirty cloth, all gummed up with furniture polish and dirt something terrible. When he had finished, the surface of the board felt as if it had been covered with a thin coat of molasses.

Cheese cloth is very inexpensive, and it is a good idea to keep a bolt or two of it on hand in the exchange at all times. Then have a supply of dustcloths cut to a convenient size and kept handy for all cleaning purposes. Purity cheese cloth, grade No. 50, is considered best for all general cleaning purposes.

When cleaning a switchboard, a piece of cloth can be dampened slightly with furniture polish, and the woodwork covered and then wiped dry and polished with a clean piece of cloth. I prefer the method of saturating a small piece of cheese cloth in polish and then wrapping it with several folds of dry cloth and rubbing the board thoroughly.

It will be found that just enough polish seeps through to do a good job. The mistake is generally made of using too much polish. If wax, either in solid or liquid form, is used, cheese cloth is the best polisher of which I know.

A bolt or two of cheese cloth will prove a good investment around any telephone exchange.

Cold Weather Simplifies Laying Cable Across River.

A drop in temperature to below zero points in late January was turned to good advantage by the construction crew of the Northwestern Bell Telephone Co. which is engaged on the underground cable project between Cedar Rapids and Iowa City, Iowa. The route of the cable crosses the Cedar River about 2½ miles below Bertram and the cable to be placed in the river at that point was at a railroad siding at Bertram when the cold wave arrived.

H. B. Marshall, superintendent in charge of the work, carefully tested the river ice and decided that prompt action would greatly simplify the placing of the 1,450-foot length of 4½-inch steel armored cable in the river. The cable was on a reel nine feet high and weighed about 30,800 pounds, so the job of moving it from the railroad siding over the Iowa roads was a proposition in itself.

The cable crew loaded the huge reel of cable on a heavy trailer, hitched a 100 horsepower FWD truck on the front, and snaked the whole load from Bertram to the river, over the kind of roads that put Iowa on all the detour maps five years ago.

Arrived at the bluff on the north side of the river, the men anchored the trailer to surrounding trees, braced the reel with heavy timbers, and, using the truck for pulling power, dragged the heavy cable across the snow and ice until it stretched from the high ground on one side of the river to the high ground on the other side. It took only two hours to lay out the cable across the river.

The cable was then lowered to the river bed through a strip cut from the ice. It was buried in a trench across the dry part of the river bed flat. At the high ground on either side of the river, it will be securely anchored to buried logs. Laying of the under-river cable was completed after eight days of hard work by a crew of 25 men.

The cable does not go straight across the river, but zigzags in long undulating curves across the river bed. This is to provide plenty of slack in the event that the river should cut a new channel at some time in the future.

Telephoning Made Easy for the Tourist in France.

Scientists are increasingly discussing the need for a universal language due to the advance in telephony and radio. Some of the difficulties of making words clear over the telephone in European cities is discussed by a writer in the New York Times under the heading, "Telephoning Made Easy," as follows:

Every year since the war Paris has grown accustomed to a greater number of languages spoken in her streets, to a wider variety of nationalities on the registers of her hotels. Such foreign names as Hennessey, Weil and MacOrlan have been so long established in France that a French pronunciation of them has become common, and they are readily recognized, even by telephone girls.

But when such names as Waysz, for example, must be transmitted by telephone, it is no wonder that the case becomes desperate, and some device other than plain spelling must be used to make the name clear. A writer in Les Annales suggests that it is no good explaining: "W for Warwick, A for anchorite, Y for Yorktown, S for Synallagmatic and Z for Zuyder Zee."

That may show a familiarity with crossword puzzles, but it will not help to deliver a message. Instead, he advises the use of the official code prepared by the telephone company for just such cases as this. A list of proper names, selected for their easy transmission, will be found in the pages of instructions in "Annuaire des Telephones."

It is the French cousin of our A for Adam, B for Boston, C for Chicago, etc.: Anatole, Benjamine, Célestin, Désiré, Edouard, Francois, Gaston, Henri, Isidore, Joseph, Kléber, Lazare, Marie, Nicolas, Oscar, Pierre, Québec, Robert, Samuel, Théodore, Ursule, William, Xavier, Yvonne and Zoe.

A good many on this list correspond with the American choice, so the tourist should not find the French one too difficult for occasional use.

Philosophical Discussion of Methods of Keeping Telephone Customers' Accounts.

By A. E. Schneider,

Auditor of Receipts, Indiana Bell Telephone Co., Indianapolis, Ind.

It is hard to conceive that in accounting work much philosophy should obtain, especially in the more selective sense now assigned to that word. Still we are subconsciously or otherwise, guided in our attitudes toward systems by the same fundamentals which guide our lives generally.

We have often heard this saying: "You tell me who your friends are and I will tell you what you are." It might be altered today with impunity to read like this: "You show me your system of records, and I will tell you what you are."

If these things operate like that—and they do—we can easily conceive our philosophy of life as having a direct influence upon the systems we adopt in our record keeping.

Turning to the subject at hand, let us examine a little more closely some of the aspects of philosophy which color the picture, when we focus our attention upon the question of ledgers versus stubs for subscribers' accounts purposes.

Security is imperative, we say, when it comes to records representing money to us. We are just so material that we think a ledger bound with a steel binding or locked with a key is synonomous with security. It is natural, of course, because we treat our automobiles and valuables that way. But should we put our records in that class? Thieves do not care about them; they want paper with silken threads impressed and important-looking negotiables.

The problem is really only a personal one. We would not steal or destroy our own records knowingly; and if we would, a ledger binding would not deter us. Then why do we hang to bound books so closely? Carelessness, listlessness, might be

failing. Do we cater to employes of this description, and when we find this characteristic in ourselves, do we cherish it? If so, a ledger type record will hardly be our answer.

This sounds like idle talk, but are not these some of the impressions we leave if someone suggests a change in our system?

Magnitude impresses us also. Books, bound and locked, are big. They look important, especially when stacked high or spread over a desk. We usually think of great amounts of condensed evidence contained within them. Books bound in large volumes convey that impression. Their magnitude is impressive.

Secrecy also confuses us. A bound book seems to embody it. You approach it with a sort of feeling of the mysterious. The keeper of books seems to realize that this element is present in his dealings. He still further adds to the mysterious by maintaining the records in code. We stand in awe in the presence of such a volume

Then, again, books all bound, exemplify finality. But the attitude toward finality is changing. Growth, changes, alterations, are its opposites. We cannot stop business because of the records. It is necessary to adapt our records to meet the growth. We cannot personally govern this growth. It becomes imperative on our part to force our records to relegate this characteristic to the discard. We are doing it, although it may be difficult.

Now let's turn to a little sheet of paper called a stub; looks weak, innocent, inferior; resembles a scratch sheet. Such a record, no doubt, loses its outward impressiveness, and with it goes our esteem. However, even though this record looks impoverished, a close examination will show that it embodies the very essence of present-day thought in production. It is built from a series of small, standardized, interchangeable parts. Well do we know the value of those characteristics in our machine workings; we have become proud of the principle. Shall we leave the records out in the cold?

Female help has taken its place in the field of business employment slowly and gradually. From the angle of business administration this growth was hardly considered as representing an epoch in its history. Just that surely also have new elements cunningly crept in which should be properly appraised.

In women you find nimbleness of finger an asset. Show me a business man who would overlook an asset! You cannot use such a characteristic in a herculean task, however. Should fingers enter the picture, as they have, the record must be cut down as small as fingers require them.

These office machines which are always being sold to us, are also made up to work better with finger-sized records. Perhaps we have the wrong slant on all of that. Perhaps the very fact that machines can be built better that way should teach us a real lesson. Machines have limitations not so unlike those we meet in our physical selves. The trouble, perhaps, is that we do not think of ourselves as having mere mechanical limitations.

Under a stub system the building is removed from the records, but should this lessen their reliability? The absence of the binding hardly carries with it special privileges.

We should have a well-established system; we should keep stubs as carefully as we do loose bills in the cash drawer. That is not so difficult. We provide a place for our money. We provide equipment for it. Stubs should work out the same way. A little equipment, a little system, should do the trick. It is not much to convert the records, but our own personal conversion is difficult.

War Orders Learned by Tapping Austrian Telephone Wires.

An interesting story of how a group of anti-Austrian Czechs learned and transmitted to the Entente intimate secrets of the Austrian and German General Staffs during the war is told in a book recently published in Prague under the title of "To the Rescue of the Entente: Secret Activities of Some Czech Patriots During the War."

The author, M. Otschenaschek, relates how in the spring of 1918 he and some friends, including F. Sis, editor of the Narodny Listy, began a search for the secret telephone cable connecting the Ministry of War in Vienna with the general staff in Berlin. After tapping many wires in vain, they were at last rewarded by hearing one day "Great General Staff in Berlin speaking. Is that the Ministry of War in Vienna?"

The next step was to fix an intercepting station. This took the form of a summer house, which they bought from an officer who had lost two sons in the war and little knew the purpose to which it was to be put.

Here, day after day, they listened in to communications, mostly from Vienna to Berlin, and created endless confusion by short-circuiting some messages, such as orders for dealing with disloyal Czech regiments, and inventing others which stopped supply of food and ammunition by diverting them to dead railroad sidings.

Telephone News Items From Europe

Some Comments on Naval Conference at St. James Palace in January and Broadcast of King's Speech—Distant Points at Which Reception of Speech Was Obtained—First Conversation Through British Station and Vessel at Sea Made

By TELEPHONY'S Special London Correspondent

The most significant event in January was undoubtedly the meeting of the Naval Armaments Limitation Conference at St. James's Palace. To those interested in telephony and speech transmission generally, it provided an exterior, but none the less absorbing interest as a unique and successful first attempt at the nearest possible approach to a world broadcast of the speech of H. M. the King in opening the conference.

The King's Broadcast.

In giving some idea of the methods by which the great result was obtained, I can hardly do better than quote from the current issue of the Telegraph & Telephone Journal, the official organ of the Post Office, by whom the necessary lines and radio circuits were supplied:

"Two separate broadcast transmissions were passed over the transatlantic radio channels for the American broadcasting companies and successfully emitted from 124 broadcasting stations in the United States. In addition to providing these radio circuits to the American broadcasting companies, the British Post Office supplied the following Anglo-Continental circuits to the British Broadcasting Corp.: Two circuits to Paris, for transmission of the speech to French stations; two to Brussels, for Belgium and retransmission to Holland, and two to Berlin via Cologne for retransmission to Stockholm, Oslo, Copenhagen, Prague, Vienna and Budapest, retransmission for German stations being provided from Cologne.

Reception was also obtained indirectly as far away as Italy and Poland. In short, nearly every country in Europe which had a broadcasting system took part in it, and in all about 270 transmitting stations were reached.

Furthermore, a trunk circuit was provided between London and the Marconi company's broadcasting station at Bridgewater for effecting transmission to Canada, while in response to requests, the Post Office station at Rugby sent out a broadcast to Australia from which, also, several stations in New Zealand and Japan

were successful in picking up the King's speech.

To carry out this comprehensive scheme so successfully required the closest co-operation between the Post Office, the British Broadcasting Corp. and the many other administrations and companies concerned, both at home and overseas. As the Observer remarked:

Thanks to goodwill and organization all went smoothly and a spectator in the control room (a B. B. C. official is speaking) would have been thrilled to listen to the various engineers talking to Paris, Berlin and other cities on the service circuits wherever operators were reporting on the quality of the transmissions along the primary lines of the broadcast.

Thus Vienna telephoned that "the lines were good as far as Prague, and good from Vienna eastward, but at Vienna itself they had changed over to wireless communication." This message was typical of what was going on throughout the two hours or more.

"We are chary," adds the Telegraph & Telephone Journal, "of using such a well-worn word as 'epoch-making' to describe this great occasion and the successful broadcasting, literally world-wide, of its opening ceremony. But we think that even the least thoughtful must have been touched by the solemnity of the occasion and its message of hope to the nations; and we should like to believe, now that the forces of wire and radio-telephony, with their unlimited range, combine to further the cause of peace, that a new epoch may truly be said to have been inaugurated."

Prayer for the Telephone.

The Pope has approved a form of prayer proposed by the Sacred Congregation of Rites for use in blessing telegraph and telephone stations and instruments. It reads thus:

"Oh, Lord, who ridest upon the wings of the wind, and alone workest great wonders, grant us that, even as with the speed of lightning Thou sendest and receivest words to and from far distant places by the properties Thou has given to this metal which Thou hast created, we, learning wisdom from new inventions, may the more speedily be led to Thee. Amen."

An Innovation.

The New Year has been signalized by the Postmaster General's announcement that a new type of telephone, combining receiver and transmitter—similar to the cradle telephone now supplied in America—will in future be fitted when required on subscribers' circuits connected with the automatic and larger manual exchanges. The combined receiver and transmitter, which is about nine inches long, rests horizontally on a cradle on the top of a square base. The height of the set is about 5½ inches.

The new instrument is being introduced as an alternative to the existing candle-stick pattern, which will remain the standard type, and an additional rental of four shillings per quarter will be charged for it.

TEN PER CENT PLUS!

The average man stands 70 inches to the top of his hat. Ten per cent above that average—77 inches—makes him a giant among his fellows. Ten per cent below the average brings the stature down to 63 inches to the hat top—a pygmy. Ten per cent, more or less, looks like a trifle to the unthinking. But it is a tremendous thing, when applied to men and their success.

Ten per cent earlier in getting to work. Ten per cent longer on the job. Ten per cent more sure-footed in making decisions—small ones at first; then larger. Ten per cent less errors. Ten per cent better memory for things that count. Ten per cent more industrious. Ten per cent more efficient in cleaning up the day's work. Ten per cent more dependable. Ten per cent more loyal to their superiors.

Oh, that magic ten per cent plus! It throws a halo around the head of the man who has it; marks him as the one to be promoted; because, remember friends, your superiors are not looking for supermen but they are continually seeking the plus men who can be depended upon—the consistent producers, the patient savers, the men who do their work in a business-like way, however humble their tasks.

It costs only a given degree of effort, only a modicum of ability, only an average capacity, for a man to hold down his job and stay on the pay-roll.

Ten per cent below this average, and he becomes a "floater," drifting from job to job, hopelessly, aimlessly; buffeted always, rising never; losing ground steadily; after many years finding himself a gray-haired laborer on a pittance.

What will you be, young man—a ten per cent plus man, or a ten per cent minus man?—R. R. Shuman in The Executives' Club News.

The Prince's Telephone.

Before embarking for Africa, the Prince of Wales, who habitually uses the telephone, spent a good deal of time each day in telephoning his personal friends. He has a clear and resonant voice—as all who have heard him on the radio will testify—and speaks with conversational ease on the telephone.

The Prince's telephone numbers at St. James's Palace are private. The operators always know when he is engaging a wire and take special precautions to prevent anything that might lead to the conversation being overheard. He never, of course, discusses affairs of state over the telephone.

Though the King and the Prince of Wales keep their telephone numbers private, those of the Duke of York and of Lord Harewood—Princess Mary's husband—are in the public directory.

From Ship to Shore.

The first conversation through a British station between a shore office and a vessel at sea was held on February 1, when the managers of the White Star line spoke to the Olympic 1,500 miles away in the Atlantic. The results were perfect.

Sir Thomas Purves, engineer-in-chief to the G. P. O., stated that it would soon be possible for the British public to telephone to ships at sea in the ordinary way.

Rough-Tongued Russia.

It would appear that the "voice with a smile" is not a feature of Soviet Russia, and the telephone operators of Moscow have for some time been making spirited protests against the bad manners and insulting language of subscribers—mainly, it would appear, of officials.

The authorities have at last been moved to issue a warning which has appeared as a paid advertisement in the Moscow newspapers. This states that the habit of using insulting language to operators is on the increase, and that in future offenders will be cut off from service and their applications for renewal disregarded.

Police Box Success.

Good progress is being made with the scheme to provide a ring of police telephone boxes round London, and during the month an important section of North London—Wood Green—has been provided with the service. Scotland Yard expresses something more than satisfaction with the results of the first instalment of boxes—functioning in the Richmond area.

Successful raids by motor bandits have materially diminished since the advent of the boxes, and special officers are now concentrating on men who are suspected of this kind of crime. The gangs are finding London generally much less easy to work than formerly, and are moving to less well-protected provincial towns, though even there choice is limited as many of the most important towns have already adopted the police box system.

Storm Havoc.

The hurricane which swept the country in the middle of January was notably hard on the telephone system, and 223 trunk lines in all were affected. No town was completely isolated, though communications were only "routed" to several by very roundabout journeys. Salisbury and Banbury were cut off entirely from direct telegraphic communication, and telegrams had to be sent to the nearest towns and forwarded by train.

In London alone, some 1,500 telephone subscribers attached to between 30 and 40 exchanges were disconnected and 245 toll lines were damaged. Most of the damage was done in outlying districts. Excellent work by the repair gangs minimized inconvenience to subscribers.

Georgia Telephone Men in Annual Meet

Fine Addresses, Informal Talks and Good Attendance Mark Annual Convention of Georgia Telephone Association—Organization's Directors Instructed to Hold at Least Four District Meetings During 1930—High Spots of the Program

The annual meeting of the Georgia Telephone Association was held at the Ansley Hotel, Atlanta, Ga., February 14, 1930. The outstanding comment of the various telephone people attending the meeting was to the effect that it was one of the best the association has ever had. Fine addresses, informal talks and a good attendance featured the meeting.

The officers and directors elected for the ensuing year are as follows: President, Wm. R. Bowen, Fitzgerald, Ga.; vice-president, C. G. Beck, Georgia state manager, Southern Bell Telephone & Telegraph Co., Atlanta; second vice-president, Walter Dakin, president, Southeastern Telephone Co. of Ga., Fitzgerald; secretary-treasurer, J. L. Mathews, president, Statesboro Telephone Co., Statesboro; general counsel, J. Prince Webster, Atlanta. Directors are Wm. R. Bowen, C. G. Beck, Walter Dakin, O. A. Knell, Dawson; A. A. Fincher, Canton; J. L. Mathews, C. D. White, J. M. Dent, Douglas; J. W. Southall, Cairo; W. M. New, Thomaston.

At 10:30 a. m. the meeting was called to order by President Bowen, who reviewed the operations of the Georgia association during the past year. He announced that he was no longer an active participating telephone man, having sold his telephone property during the past year, but he intended to keep up the contacts with the telephone men in the future.

The Business Session.

The minutes of the previous annual association meeting were read by Secretary Mathews and unanimously approved. The treasurer's report showing the financial condition of the association was also read by Secretary Mathews and unanimously adopted.

C. G. Beck, chairman of the membership committee, made a report to the association which was received with much interest. He asked, however, to be relieved of the chairmanship of the membership committee during the coming year. Those appointed by President Bowen to serve on this committee are J. L. Mathews, chairman; W. M. New and C. G. Beck.

The members of the association unanimously adopted the following amendment to its constitution providing for honorary membership in the association:

"Any active member of the association who disposes of his telephone connection during membership in the Georgia Telephone Association, and who desires to continue as a member of said association, shall be eligible to honorary membership in the association to hold office."

An interesting address was then delivered by C. O. Bickelhaupt, vice-president, Southern Bell Telephone & Telegraph Co. on "The Telephone Business, Present and Future."

Walter Dakin, president, Southeastern Telephone Co. of Ga. next gave an address on, "Differences in Operating Conditions in Telephone Industry as Between the Middle West and the South," which brought out many interesting comparisons. His address was listened to attentively.

During the luncheon, entertainment was provided by F. P. Linder, manager, Hart County Telephone Co., Hartwell, who had composed some amusing verses on "Cash, Clothes and Cars."

The Afternoon Session.

The first address at the afternoon session was delivered by R. C. Norman of Atlanta, state tax commissioner, on the subject "The Changing Tax System in Georgia."

J. E. Warren, general commercial manager, Southern Bell Telephone & Telegraph Co. next gave a talk on "The Installation of the Millionth Telephone Station in Southern Bell Territory and What It Means to the South."

"Operating to Insure Continuous Income," was the subject of the next address, ably presented by O. A. Knell, manager, Continental Telephone Co., Dawson.

Frank King of the Stromberg-Carlson Telephone Mfg. Co., who had been expected to give an address on "Furnishing Modern Telephone Service to a Small Community at a Profit" was unable to be present to deliver his talk but it was announced that copies of the talk would be sent to each member present.

President Bowen then announced the convention open for discussion of any subject that any delegate might wish to bring up.

H. M. Stewart of the Kellogg Switchboard & Supply Co. made a very interesting talk to the association showing what aid the Kellogg company would give to the Independent companies in an effort to increase their number of subscriber stations.

J. Prince Webster, the general counsel of the association, reviewed at some length the development of the telephone industry as coming before the state authorities during the past year, dealing especially with the sales tax matter.

The report of the nominating committee on 1930 association officers was then submitted. The names of the officers elected have been given previously.

Walter Dakin addressed the convention upon the question of the association rendering a greater service in Georgia to the smaller Independent companies by having district meetings and discussions of technical matters, the district meetings to be held in various parts of the state in order to bring the association benefits to the territory in which the district meetings would be held.

District Meetings to Be Held.

Mr. Dakin moved that the board of directors of the association endeavor to work out some plan during the year for the holding of these district meetings, in order that the benefits might be so distributed. J. M. Dent seconded the motion and spoke very earnestly endorsing Mr. Dakin's suggestion. F. P. Linder, O. A. Knell, C. O. Bickelhaupt, J. P. Manning and President Bowen also spoke in favor of carrying out a plant as outlined by Mr. Dakin.

The motion was unanimously adopted and the board of directors instructed to endeavor to hold at least four district meetings during 1930 and to see that proper invitations be extended to all of the telephone men in the district to be affected prior to each meeting.

There being no further business before the convention, President Bowen declared the meeting adjourned.

Telephone Wire of President of Poland Tapped by Foes.

Warsaw, the Polish capital, has been stirred by a discovery that an important telephonic conversation between the president of the republic of Poland and Premier Bartel was overheard by as yet unknown listeners-in and circulated among M. Bartel's political adversaries.

This happened in late December when M. Bartel was busy forming a cabinet and spoke one day to the president, who was spending a holiday at Spala. Afterwards the contents of the conversation were used against the premier. Complaints have been made many times, both in the press and parliament, but the minister of post and telegraph always denied the existence of a "black cabinet."

Nevertheless, during December, it is said that telephone conversations were constantly interrupted. It is characteristic that the listeners-in always seemed to impart their information to a large number of people more or less important in political life. Warsaw's telephones, instead of a public utility, became a nuisance.

For the Ma

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THE business man of today has discovered the value of time. In the conduct of his affairs he has very largely eliminated, or at least reduced, the number of seconds and minutes which he used to waste. He is eager to adopt any proven device which aids efficiency. Even though it should cost more, he realizes that the time it saves will profit him many times over if applied in remunerative activity.

For this reason, telephone companies find that the Monophone makes an instantaneous appeal to business men. With an actual instrument on his desk before him, he is quick to visualize the countless seconds and minutes which this modern telephone will save. Its convenience promotes faster action, its one-hand operation makes the jotting of notes or reference to papers a quicker proceeding, and its clarity of transmission makes time-wasting repetition unnecessary.

Telephone executives are finding that salesmen sent out to make personal demonstrations of the Monophone secure surprising results in new business and added extensions. Why don't *you* try this plan?

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Personal Notes from the Field

E. F. Carter, recently elected a director of the Missouri Telephone Association and vice-president and general manager of the Missouri Telephone Co, Columbia, Mo., was born in Ipava, Ill., on April 16, 1882. He received his education at the Ipava High School, the State Normal University at Normal, Ill., and the Kansas City School of Accountancy, Law and Finance.

After finishing school Mr. Carter taught school in Ipava, Bernadotte, Table Grove and Canton, Ill. He entered the telephone field in June, 1909, with the Missouri & Kansas Telephone Co. at Carrollton, Mo., serving in the positions of groundman, troubleman, exchange foreman, assistant wire chief and traveling auditor. In September, 1910, he became chief clerk and general traffic superintendent at Kansas City, Mo., which position he held until October, 1916, when he entered the employ of the Southwestern Bell Telephone Co. as district traffic chief at Kansas City, and in October, 1919, becoming general traffic supervisor.

He remained with the Bell company until January, 1923, when he left to become the manager of the Columbia Telephone Co. at Columbia, Mo. In June, 1929, he was elected to the position of

E. F. Carter, Elected a Director of the Missouri Telephone Association at Its Annual Convention, Has Been in the Telephone Field for 21 Years.

vice-president and general manager, which he now holds.

Mr. Carter has served as chairman of the traffic division of the Missouri Telephone Association for the past three years, and at the annual convention of that organization in November was elected a director.

E. D. Glandon, of Pittsfield, Ill., in late January retired as president of the local Chamber of Commerce, of which he was one of the organizers. The Noonday Luncheon Club, the predecessor of the Chamber of Commerce, was organized in January, 1920, with Mr. Glandon as president, and he held that office continuously until his retirement.

In a recent editorial, the Pike County Times reviewed the "Ten Years of Faithful Service" of the Chamber of Commerce, and said this concerning Mr. Glandon:

"We cannot close this brief commendation of the work of the Chamber of Commerce without saying a word concerning the retiring president who voluntarily retires at this time after ten years of continuous service. Mr. Glandon has been at the head of the luncheon club and its successor, the Chamber of Commerce, since it was organized ten years ago last month.

He has given freely of his time without compensation and has even spent his own money at times in promoting the interest of the city. He has worked with an eye single to the improvement of Pittsfield and Pike county.

The results of this ten years of service are apparent without specific mention; they are the achievements of the Chamber of Commerce under Mr. Glandon's leadership."

J. G. Ihmsen, of Albany, N. Y., president of the Up-State Telephone Association of New York, sailed from Honolulu, Hawaii, on February 1 on the first part of his return trip to New York state. Mr. Ihmsen spent about 50 days in Honolulu and "would like to stay six months, if I had nothing else to do."

Edwin D. Schade, who has been secretary and general manager of the Johnstown Telephone Co., Johnstown, Pa., for nearly 30 years, has retired from official connection with the company. His retirement dates from March 1.

The Johnstown Telephone Co.'s holdings in Johnstown and surrounding towns have been purchased by the Associated Telephone Utilities Co.

Mr. Schade was born in Greenville, Pa., July 14, 1867, and educated in the public and high schools and the Thiel College at Greenville. In 1889 he went with the Adams Express Co, being successively driver, clerk, train messenger, office cashier, agent at Ridgeway, Pa., agent at Johnstown and traveling auditor.

On September 1, 1900, he resigned to accept the position of general manager of the Johnstown Telephone Co. He immediately set to work rebuilding the plant 80 per cent underground, common battery system, with modern fireproof office and exchange building. During 1903 and 1904 he organized the Pittsburgh-Johnstown company and built a line between those

E. D. Schade, for 30 Years the Secretary and General Manager of the Johnstown Telephone Co., Johnstown, Pa., Has Retired From That Position.

cities—the connecting link east and west.

He was president of the Western Pennsylvania Independent Telephone Association in 1910 and director of the National Independent Association in 1911 and 1912. He was president of the Pioneer Independent Telephone Association of United States in 1928. Mr. Schade is a life member of the B. P. O. E., Johnstown Lodge 175, of which he is past exalted ruler.

Obituary.

J. (Jack) L. Adams who was general commercial agent of the Pacific Telephone & Telegraph Co., southern division from 1920 to 1928, died on February 24 at his home in La Crescenta, Calif., following a protracted illness.

Born in Odessa, Mo., on November 27, 1885, Mr. Adams went to Los Angeles in 1908, where he was identified with the telephone business in Southern California for 20 years. Mr. Adams had held many important positions and as general commercial agent of the Pacific company had a host of friends among the Independent telephone men of the Pacific Southwest.

Through his untiring efforts, the harmonious relationship between two groups of the telephone industry in Southern California steadily increased, with consequent splendid cooperation in meeting the general problems of the telephone business.

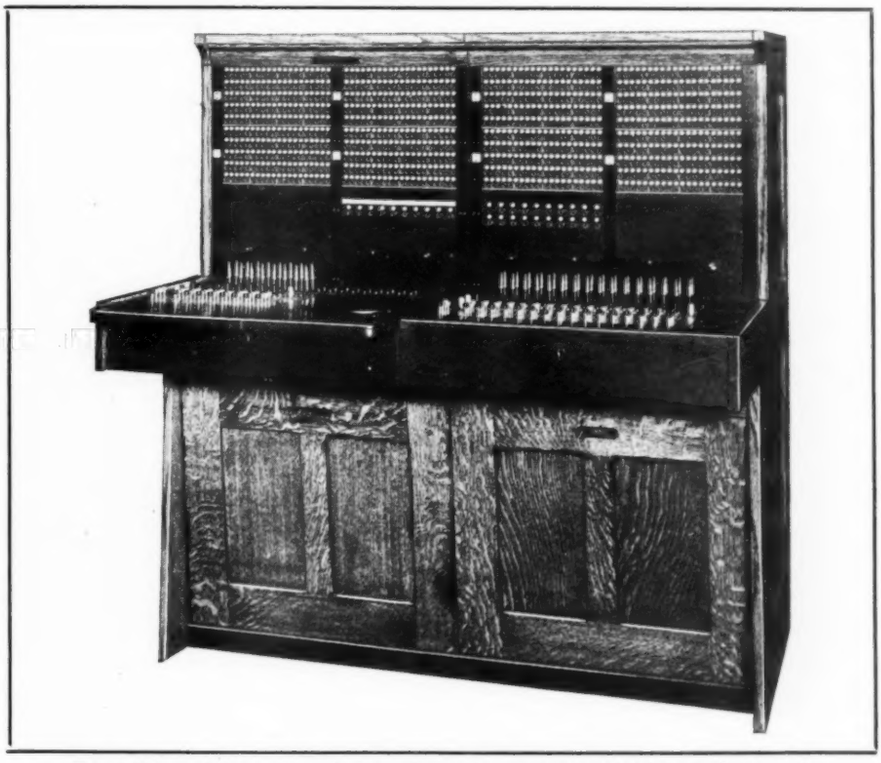
With the Manufacturers and Jobbers

Steel Frame Junior Switchboard by Stromberg-Carlson.

More than 60 installations in this country and abroad of Stromberg-Carlson junior multiple switchboard equipment, it is said, have convinced many owners and operators of small exchanges that it is possible to provide up-to-date service at a profit to the operating company. The general acceptance of the Stromberg-Carlson junior multiple has exceeded the expectations of its most optimistic sponsors.

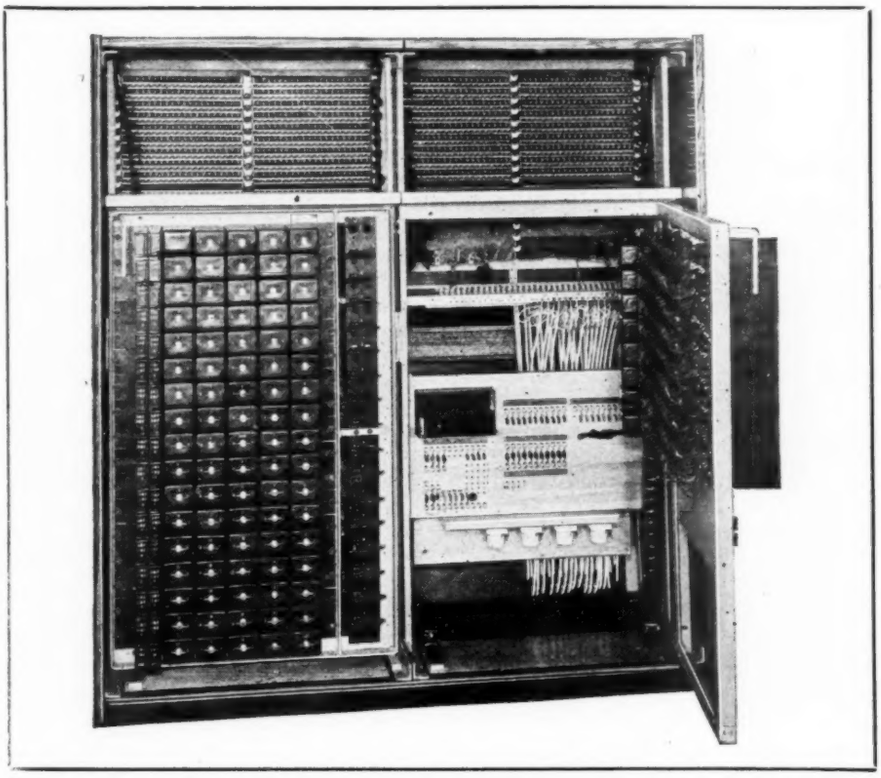
The Stromberg-Carlson Telephone Mfg. Co. has always featured steel frame construction in its larger multiple equipments. In line with this policy of always keeping in the forefront of progress in the industry, it is now applying the feature of steel frame construction to its junior multiple equipment. This feature affords many improvements. The switchboard has a continuous black face, thus making the junior multiple the most attractive board of this type that it has ever produced.

The structural strength of the board also is greatly increased. Not only will the new junior multiple stand up under any strain after installation, but the possibility of glued cabinet joints opening during transportation is declared to be entirely eliminated.



Front View of Stromberg-Carlson Steel Frame Junior Multiple Switchboard.

Many magneto exchanges located in villages where no central power supply has been available until the last few years, have been converted to central energy operation through the installation of the junior multiple.



Rear View of Junior Multiple Switchboard of Stromberg-Carlson Telephone Mfg. Co., Which Contains the Service Features of Larger Switchboards.

It has always been the ambition of nearly every magneto telephone exchange manager to equip his exchange for central battery operation. However, the usual central energy layout has been much too expensive for the small exchange to consider. The fact of the matter is that obtaining a profit from selling telephone service of any type, to small communities at present-day operating costs, is an outstanding problem to the telephone operating man today.

The junior multiple switchboard, it is stated, has solved this problem with the better class of telephone service it affords. By installing a junior multiple board and giving the public better service, a general increase in rates can be secured, resulting in greater profits to the operating company, the Stromberg-Carlson company contends. Furthermore, subscriber lists are more apt to increase than to decrease under these conditions, because today the public demands up-to-date service, the cost being a secondary consideration. That goes with our higher standard of living.

The junior multiple board is a standardized product and, as such, can be manufactured on a production basis. It has no frills, and utilizes simple and reliable circuits. These features reduce costs so that both initial investment and operating costs are brought well within the means of

any company operating more than 50 lines. All cord circuits are universal, which means that both magneto and central energy telephones may be used, as conditions demand, without slowing up the service by forcing the operator to make special cord selection for the different types of service.

Following are several features offered by central energy service which are declared to make that type of exchange more profitable than the magneto exchange:

1. Uniformity of current supply.
2. Elimination of dry cells and cost of replacement.
3. A constant transmission level.
4. Positive supervision.
5. Uniformity in operating.
6. Reduced operating cost.
7. Simpler, and therefore reduced, cost of maintenance.
8. Lower investment in substation equipment.
9. Better rates.

Villages and small cities that have been equipped with out-of-date central energy systems have also welcomed the opportunity to get up-to-date equipment at the low cost that is possible with the Stromberg-Carlson junior multiple.

If the exchange is of less than 800 lines and the expected growth will not exceed that number for some years, the junior multiple solves the problem, it is declared. It is a comparatively inexpensive board which is said to furnish the best service that can be obtained with any switching equipment of the non-feature type. It can best be described in a few words, it is stated, as the ideal board for the small office.

Stromberg-Carlson is believed to have taken a big step in adding the steel frame feature to its already outstanding junior multiple switchboard, which is said to have placed many small exchanges on a really profitable operating basis.

Hubbard & Co. Issue a New Publication on Grounding.

"Grounding Notes" is the title of a publication recently issued by Hubbard & Co., of Pittsburgh, Pa., Chicago, Ill., and Oakland, Calif., with the cooperation of the engineering department of Copperweld Steel Co. of Glassport, Pa. It is a two-page leaflet published "in the interest of better grounding," it states. It "should serve as the medium to pass on examples of good grounding practices, to answer your questions and to relate grounding experience."

One of the topics of particular interest to telephone men is discussed under the title "Where Telephone Company Places Grounds" on the first page. It says:

"A telephone company in Ohio found that by installing their ground rods two feet away from the face of the subscriber's building they obtained more efficient grounds. Tests showed lower resistances and practical results showed improved ringing grounds and more effective lightning protection grounds."

Some of the other topics discussed are "Method of Grounding Signal Mast," "How to Eliminate Guessing of Soil Resistance," "Grounding Wire Fences Along Power Lines," and "Grounding Switch Frames and Lightning Arresters."

This booklet and its future issues should prove most beneficial to the telephone plant man in answering his problems on grounding. Copies of it may be obtained on application to Hubbard & Co., 6301 Butler St., Pittsburgh, Pa.

Annual "Suggestion" Luncheon of Automatic Electric Inc.

Automatic Electric Inc. gave its annual "Suggestion" luncheon on Saturday, February 22, in the grand ballroom, Hotel Sherman, Chicago. This luncheon is a regular yearly affair at which prizes are awarded to employes making acceptable suggestions during the year. The suggestions covered improvements in methods of manufacture, more suitable materials, improvements in routines and systems, elimination of waste, the betterment of working conditions, improvements in design, etc.

Approximately 600 employes attended the luncheon this year. R. C. Gifford, works manager, presided, and, after a short statement concerning the suggestion record for the year called upon W. F. Benoist, president, who talked briefly, complimenting the employes present on their foresight and loyalty. The chairman then introduced Harry Newman Tolles, president of the Sheldon school, who delivered a most enjoyable address on the relationship between the worker and his job. At the close of the meeting, several hundred valuable prizes, ranging from pen and pencil sets to radios, diamonds and watches, were distributed to the successful suggestors.

The company's suggestion plan has been in operation for 18 years and has been wonderfully effective in constantly improving the company's products as well as its production and routine efficiency.

Engineering Department of Prettyman Company Issues Booklet.

"Mechanical Properties of Certain Woods Used for Poles" is the title of Bulletin No. 2, compiled by the engineering department of J. F. Prettyman & Sons. Some of the questions answered accurately and concisely in this bulletin are: How much smaller Southern yellow pine poles, creosoted full length to the heartwood, may safely bear the maximum loading of other kinds of poles? What is the resistant moment in foot pounds of each?

The bulletin also tells the proper size in each species to bear a given load; gives a formula and then works it out; tables, charts and references.

Copies of the bulletin may be obtained on application to J. F. Prettyman & Sons, Charleston, S. C.

Paragraphs.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has just announced that an order for a six-position toll board for Weldon, N. C., has been placed with it by the Carolina Telephone & Telegraph Co. at Tarboro, N. C.

W. Earle Pashley, advertising manager of The C. F. Pease Co., 813 North Franklin street, Chicago, Ill., has been appointed assistant sales manager and second vice-president. Simultaneous with that appointment Mr. Pashley was elected to the board of directors. In addition to his new responsibilities, he will continue in charge of advertising and all promotional activities of the company.

Mine Safety Appliances Co., Pittsburgh, Pa., has just issued bulletin No. 17 descriptive of the Jones gas detector. Numerous explosions and apparent hazards in sewers, manhole entrances to gas lines, electrical conduits, etc., prompted the development of this gas detector by G. W. Jones, explosive chemist, United States Bureau of Mines.

The bulletin also describes M-S-A carbon monoxide detector ampoule. This is a new type of detector which readily indicates very low concentration of carbon monoxide.

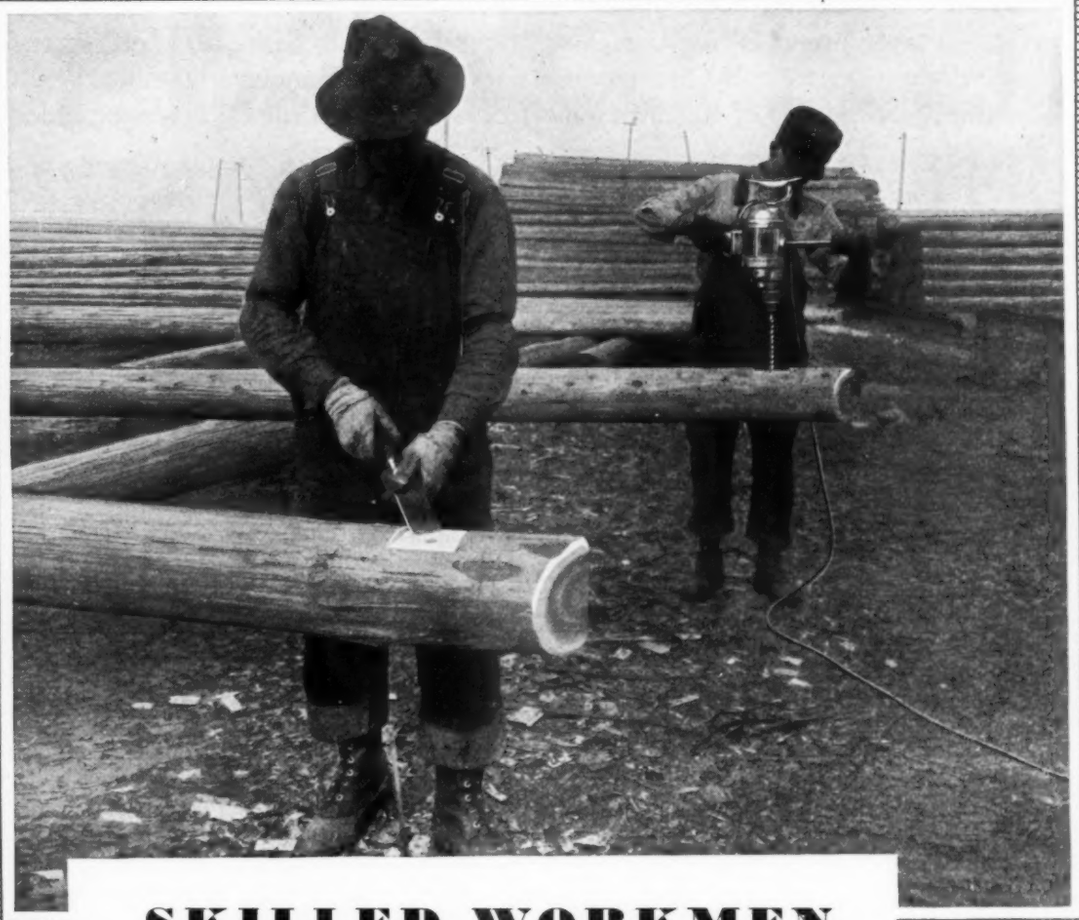
Ernest H. Bradley is now New England manager of the W. N. Matthews Corp., St. Louis, Mo., and will handle all sales matters in the New England states. His headquarters will be Room 1001, Statler building, Boston, Mass.

Mr. Bradley will have a complete line of samples of all of Matthews products and the sales policy of W. N. Matthews Corp. will be the same as it has been in the past under the able direction of Hugo Van Rosen, formerly New England sales manager, who has gone to Chicago to live.

The Matthews corporation is looking forward to continuance of the pleasant relationship it has enjoyed in the past with its many New England friends. It is sure that they can count on the hearty cooperation of Mr. Bradley, who is well and favorably known to many of them.

Prices in the Metal Markets.

February 24: Copper—Quiet; electrolytic spot and future, 18c. Iron—Quiet; No. 2 f.o.b. Eastern Pennsylvania, $18.50@20; Buffalo, $16.50@17; Alabama $13@15. Tin—Easy; spot and nearby, $38.37; future $38.62. Lead—Quiet; spot New York, 6.25c; East St. Louis, 6.10c. Zinc—Easy; East St. Louis spot and future, 5.15c. Antimony—9.25c. Quicksilver—$124.



SKILLED WORKMEN

—contribute their share to the uniform quality of

"P & H PROCESS" POLES

The skill of P & H Pole makers and inspectors is the result of experience and continuous education. Most of these men have been with this organization for many years.

To them, a P & H Pole is an important unit in the Nation's great systems of overhead transmission. It is more than simply a tree that has been cut, trimmed and peeled. They know that the P & H Brand and P & H advertising proclaim their work. That, in itself, is a strong incentive to do their best.

Skillful workmanship is just another reason why P & H Poles are

"Still in the Lead"

FAST SHIPPING SERVICE on all cedar pole requirements—Northern White Cedar or Western Red Cedar.

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New York, N. Y., 50 Church St.
Boston, Mass., 733 Public Service Bldg.
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Chicago, Ill., 19 So. La Salle St.
Kansas City, Mo., 201 Mainstreet Bank Bldg.
Omaha, Neb., 711 Electric Bldg.

Predetermined results through laboratory control of "P & H" operations

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Lawyers and Engineers Declare Radio Act Needs Amendment.

Legislation to remedy defects in the radio law and to define more clearly the rights of parties in court procedure was urged by lawyers and engineers at a discussion in Washington on February 20 of radio legal problems, conducted by the committee on communications of the American Bar Association.

Virtually unanimous agreement for the repeal of the Davis amendment to the radio act of 1927, requiring the distribution of broadcasting facilities among the five arbitrary zones, was reached. Government officials identified with radio concurred in the views of members of the committee that the legislation was unsound and worked to the disadvantage of the West and South. The amendment specifies that all broadcasting facilities be distributed according to population in the five zones.

The committee did not consider the anti-monopoly clause of the law, forbidding the merging of wireless and wire companies. Mr. Caldwell explained that the Senate committee on interstate was considering the Couzens bill, which includes this question, upon which hinges the proposed purchase by the International Telephone & Telegraph Corp. of the communications units of the Radio Corp. of America.

Two radio engineering executives, W. D. Terrell, chief of the radio division of the Commerce Department and Dr. J. H. Dellinger, urged repeal of the Davis amendment, except as to the distribution of channels. Mr. Terrell said he always was of the opinion that the legislation "attempted too much."

Bell Acquisition Will Eliminate Duplication of Service.

The Interstate Commerce Commission recently authorized the Southern Bell Telephone & Telegraph Co. to take over the properties of the Hartsville Home Telephone Co., Hartsville, Tenn., which serves 27 owned and 80 service stations, of which 12 stations are duplicated by the Bell company. The Bell company owns an exchange at Hartsville, which serves 219 owned and 35 service stations.

For some years the earnings of the Hartsville company have not been sufficient to enable it to maintain its plant properly, the commission found, and as a result its properties are not in condition to render commercial service. On account of the existing duplication of facilities, the Bell company has been unable to reconstruct its own plant, or to provide for future development. The consolidation of the two exchanges and the elimination of the duplicated facilities will enable the Bell company to serve the public better and more economically than at present.

On October 19, 1929, the Bell company contracted to purchase the physical telephone properties of the Hartsville company, free from all liens and encumbrances, for $1,056. An appraisal made by one of the Bell company's engineers found the reproduction cost new of the properties, less depreciation, to be $5,54.

The Bell company estimates that it will be necessary for it to expend $995 on its own plant to provide additional facilities and for reconstruction purposes. In the first nine months of 1929, operating revenues of the Hartsville company were $719.36, and the operating expenses are given as the same amount.

Evidence Presented to Resist Further Increase in Rates.

Evidence presented at North Manchester, Ind., February 19 before members of the Indiana Public Service Commission in the fight by telephone patrons of 15 towns to resist further increases in rates asked by the Northern Indiana Telephone Co. showed that the company lost 1,000 subscribers as a result of the last rate increase granted by the commission less than a year ago.

W. A. Smith, a local manager for the company testified that the present increases of 25 cents a month on city telephones would bring considerably increased revenue, but that free toll service to be established between North Manchester and Sidney, Macy and Fulton and Akron and Macy would reduce revenues.

Engineers for the public service commission placed a value of $536,862 on the properties of the company on the basis of reproduction costs new, less depreciation. The company asks a valuation of $600,000 for rate-making purposes.

Commission Settles Dispute Regarding Routing of Toll Messages.

The Indiana Public Service Commission on February 14 authorized the Northern Indiana Telephone Co. to use its own facilities in the routing of toll messages originating at its Bourbon and Etna Green exchanges and destined to Warsaw or independent points beyond, and the Commercial Telephone Co. was directed to accept these toll messages when so routed upon the express condition that nothing in the order shall be construed as affecting the right of the Commercial Telephone Co. to route toll messages originating at its Warsaw exchange or independent points beyond over its own facilities when destined to the Bourbon or Etna Green exchange of the Northern Indiana Telephone Co.

The commission also ordered that the division of revenue obtained from toll messages between points involved shall be on the basis of 25 per cent to the originating company, the balance to be divided on the portion each company owns of the total mileage, determined by air line measurement.

The Northern Indiana Telephone Co. showed to the commission that on or about November 1, 1929, toll messages originating at its Bourbon and Etna Green exchanges and destined to the Warsaw exchange of the Commercial Telephone Co. or points beyond and routed over the toll circuits of the Northern Indiana company to a point half way between Atwood and Warsaw, were refused by the Commercial Telephone Co.; that thereupon, the Northern Indiana Telephone Co. refused to accept toll messages originating at Warsaw and terminating at the Bourbon and Etna Green exchanges of the Northern Indiana Telephone Co. over the toll circuits wholly owned by the Commercial Telephone Co.

The Northern Indiana Telephone Co. showed that it had heretofore complained to the commission with respect to the refusal of the Commercial Telephone Co. to accept toll messages originating at Bourbon and Etna Green and routed over the toll circuits of the Northern Indiana Telephone Co., to Atwood and thereafter over the toll circuit jointly owned by the Northern Indiana Telephone Co. and the Commercial Telephone Co.

The Northern Indiana company alleged that an emergency existed for an early hearing and settlement of the matters with respect to the routing of toll messages originating at Bourbon and Etna Green and destined to Warsaw or independent points beyond and with respect to a division of revenue between the two companies from toll messages.

Dispute between the parties as to the routing of toll calls between points involved, resulted in serious interruptions of service during the latter part of 1929, the evidence showed.

The dispute became so serious that the Commercial company sought an injunction against the Northern Indiana company in the Kosciusko Circuit Court. A demurrer filed by the Northern Indiana company to

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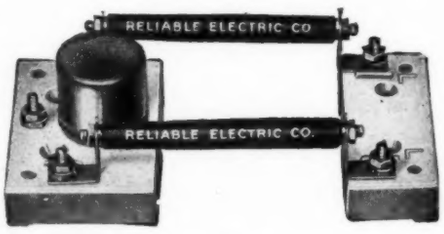

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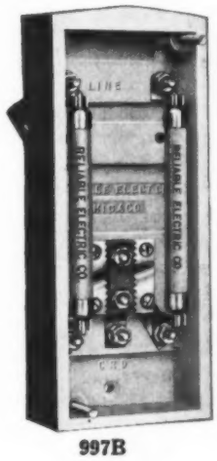

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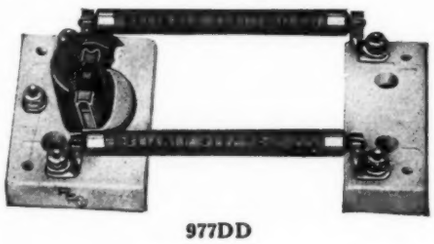

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Self Cleaning

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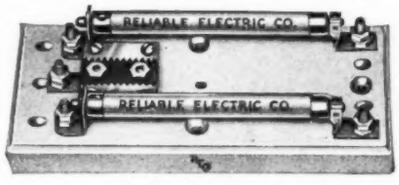
With Cover



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Low Maintenance

"the choice of the majority"

Reliable Electric Company

3145 Carroll Ave. Chicago, Ill.

the complaint of the Commercial company in the court proceedings, was sustained.

Following the court proceedings, messages originating at exchanges owned by the Northern Indiana company have been routed over its own facilities, as prayed for in the petition in this cause, and messages originating at exchanges of the commercial company have been routed over its circuits when destined to exchanges involved of the Northern Indiana company.

No complaints concerning the service were received by the commission since the arrangement, now in effect, was instituted. It appeared, therefore, that the Northern Indiana company is able to render satisfactory service over its own facilities for messages originating at its own exchanges involved in this case and destined to Warsaw and independent points beyond.

From a service standpoint alone, the facts warranted the commission in assuming jurisdiction in the matter, when it was recalled that toll service was seriously interrupted during the progress of the controversy.

The Northern Indiana company asked that it be permitted to use its own facilities for transmission of toll messages, originating at exchanges owned by it. Such a proposition appeared to be fair and reasonable so long as it would not affect the service to the public or compel the public to pay higher rates for such service.

The fact that the Northern Indiana company has been able to handle toll calls originating at its exchanges over its own facilities for some time, without any complaint to the commission as to service, seemed the best indication that the granting of the petition would not require the public to accept unsatisfactory service. There has been no confusion as a result of the present arrangement, the commission found, and therefore granted the petition.

Commission's Accounting Department Aids Small Companies.

The accounting department of the Nebraska State Railway Commission reports that 190 telephone companies are now filing with that body and are subject to its jurisdiction. The larger companies make monthly reports, but the others are permitted to make one a year do. In addition, they must make reports on various matters connected with applications for securities and rates. All of these reports are carefully looked over and audited and the information arranged so that when any rate or security issue comes up, the commission has at hand all that it needs for prompt action.

This department carries on a correspondence course in accounting for men new at the managerial end of the business or for whom the accounting system ordered by the commission has too many mysteries. During the last year 23 personal visits were made to various telephone companies in the state, and accounting studies have been compiled and recommendations made in connection with the various applications for service.

Some of these visits are made on the request of the companies or managers themselves and the latter bear the expenses. Other visits are made by order of the commission when desirous of ascertaining facts not shown clearly by the reports. On the whole, however, the department has succeeded in finally selling the commission accounting system to the companies, a difficult task in the beginning, but now fairly easy when new occasions arise. Lawrence W. Kemmer is now in charge, with two assistants.

California and Maryland Subscribers Value "Telephony."

P. N. Pattison, general commercial agent for the Pacific Telephone & Telegraph Co., with headquarters at Los Angeles, Calif., is one of TELEPHONY's subscribers who appreciates regular, prompt service. In a letter remitting for a renewal of his subscription, Mr. Pattison says:

"Please send the copies along so I do not miss any. The magazine is very necessary in my work."

John M. Heath, first lieutenant, United States Army, stationed at Baltimore, Md., is another subscriber who likes to get TELEPHONY regularly. When he sent in his renewal check, he added this message:

"Please see that your journal is sent continuously, as TELEPHONY is the one bright spot of each week."

Asks Authority for $120,000 Stock Issue on Nebraska Plants.

The Central Nebraska Telephone Co., which operates a group of small-town exchanges in the southwestern section of Nebraska, has applied to the Nebraska State Railway Commission for authority to issue $120,000 worth of additional stock. Once before it had asked for authority to issue $350,000 worth of stock and also bonds, but the commission declined to approve more than $60,000 of stock.

In a recent conference with G. D. Gray of Denver, Colo., one of the officials, and his attorney, the commission was informed that following the previous action of that body, the purchasers, in order to finance the deal, had borrowed $120,000 from the holding company, giving a year's note for that amount. Mr. Gray said that their attorney had advised them that by following that procedure it would not be necessary to secure the approval of the commission.

Chairman Curtiss concedes that this was correct advice, but the company now faces the necessity of renewing the note, and the commission holds that where that situation arises, the debt then being projected over a period of one year, its jurisdiction sets in. For this reason, the company now asks for the additional stock issue. It asks that the commission make a valuation of all of the properties, in connection with P. J. Upright, of Grant, its general manager.

The application sets up that counting in the $4,500 the company has put into the properties during the year it has owned them, the property has actually cost the present owners $180,000, which is the sum of the present authorized stock and the proposed issue. Members of the commission, aware of the condition of these properties, express doubt as to whether any such corresponding valuation will be shown.

The net income of the properties has been small, and it will be necessary to materially increase rates at some of the exchanges before a good net revenue balance is possible. Several of the exchanges have schedules away below the average, and it is planned by the company to seek increases for these. Most of them are in communities where proper rates might be greater than the traffic will bear.

The commission will put its engineers into the field shortly to make the valuation asked for. The exchanges of the Central Nebraska company are located at Grant, Dickens, Wellfleet, Sutherland, Maxwell, Brady, Imperial and Palisade.

Rate Base Established; Increase in Rates Approved.

The Dakota Public Service Co. was recently authorized by the North Dakota Board of Railroad Commissioners to place in effect the following schedule of net rates for service at Devils Lake within the base rate area:

Business, individual line	$4.25
Business, two-party line	3.75
Residence, individual line	2.25
Residence, two-party line	2.00

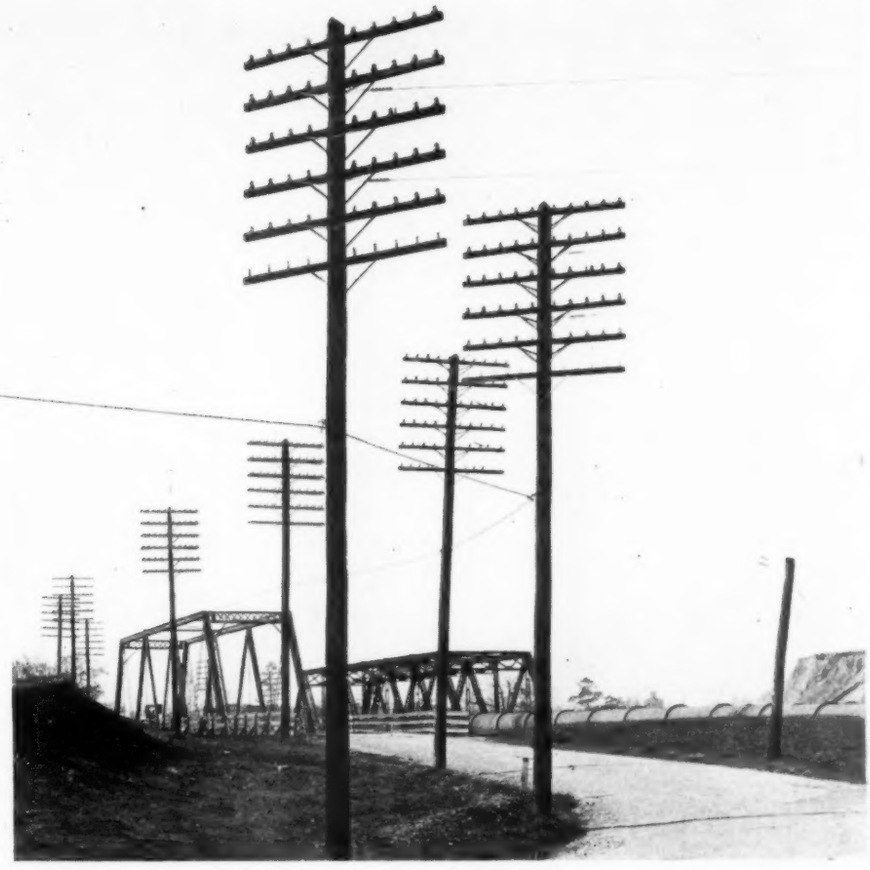
Outside the base rate area but within the exchange area—

Rural business, grounded line	$2.75
Rural residence, grounded line	2.00
Service station, yearly	6.00

The Dakota Public Service Co., acquired the telephone property at Devils Lake as of August 1, 1928, and shortly thereafter began a thorough rebuilding and rehabilitation of the property, including a change in the type of service to common battery equipment.

The company introduced a valuation of its Devils Lake property as of August 1, 1929, which showed a reproduction cost of $154,468.95 and a reproduction cost less depreciation of $143,331.74. To the latter figure was added amounts for working capital and going concern value, making a claimed rate base of $164,464.42.

The testimony of the company showed that on this valuation the present rates, after deducting operating expenses and depreciation charges, would yield a return of 1.32 per cent and that the proposed



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CREOSOTED SOUTHERN PINE
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The name Creo-Pine on Creosoted Southern Pine is more than a trademark. It is a pledge of honest, accurate manufacture and rigid inspection from standing tree to finished product. Back of it are twenty-two years of wood preserving experience.

For Tomorrow's Voice Highways

Larger and larger cables and ever increasing long distance circuits are placing a heavier load each day on telephone poles. But however heavy the load the message must go through quickly—with no allowance for pole failures. To meet these new conditions—you may buy Creo-Pine poles. They are made of creosoted Southern Pine. Numerous tests have proven it the strongest of common pole woods. Effectively fortified against decay and the attacks of insects by the S. W. P vacuum-pressure process of creosote injection, they maintain this strength over a long period. Shipments can be made from either of our treating plants, and further information about Creo-Pine poles will be given gladly by any of the sales offices listed below.

Creo-Pine Products
Include:
Poles
Piling
Conduit
Cross Ties
Cross Arms
Floor Blocks
Sub-Flooring
Bridge Timbers
Structural Timbers

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rates on the same basis would yield a return of 6.2 per cent on this valuation.

The board found that the property was practically new, due to the rebuilding program and change in the type of service so that a study of present day reconstruction costs would vary little from the investment costs of the property. There was but slight difference between the reproduction costs found by the company and those found by the board's engineering department and the figures furnished by the company for structural value were used in this proceeding.

The amount of working capital as used by the company was not excessive, the commission said, and would be allowed, giving a figure of $149,017.53 for a rate base exclusively of any allowance that might with propriety be used for going concern value.

The commission further found that, using the rate base thus found and applying to it the net estimated telephone earnings under the proposed rates, of $10,209.42 as shown by the applicant's testimony, the return would be 6.8 per cent, so that the question of any allowance for going concern value could be eliminated. The return so found was not excessive and the proposed rates were therefore approved.

Wisconsin Company Authorized to Supplement Existing Rates.

Effective February 1, 1930, the Young America Telephone Co., Barton, Wis., Route 2, was authorized by the Wisconsin Railroad Commission to supplement its existing rate schedule by adding thereto the following rules and monthly rates:

Business service—
Extensions within same building...$1.00
Extensions within same building with switch 1.15
Residence service—
Extensions within same building... .75
Extensions within same building with switch ..... .50

The equipment, instruments, lines, etc., on any subscriber's premises, furnished by the Young America Telephone Co., shall be and remain the property of the company whose agents or representatives shall have the right to enter premises at any reasonable hour for the purpose of installing, inspecting or repairing the instruments, lines, etc., and upon termination of the service, for the purpose of removing such instruments, lines and equipment.

No liability shall attach to the company by reason of any defacement or damage to the subscriber's premises resulting from the installation, existence or removal of such apparatus, wiring, etc., when not the result of negligence of the telephone company or its employes.

Summary of Commission Rulings and Schedule of Hearings.

ALABAMA.

February 8: Application of Home Telephone Co. of Mobile for permission to abandon all its telephone service in the counties of Mobile and Baldwin, granted. The order became effective on February 18.

CALIFORNIA.

February 17: Agnes Richey Kattenhorn applied for permission to extend telephone service into the Tule Lake district, Siskiyou and Modoc counties, from an exchange at Merrill, Ore.

February 19: The Sunland Rural Telephone Co. authorized to issue and sell at not less than par, on or before December 31, 1930, its common capital stock in the sum of $14,600, and to use the proceeds to reimburse its treasury on account of capital expenditures on its system serving the communities of Sunland and Tujunga and adjacent toll lines in Los Angeles county.

ILLINOIS.

February 25: Hearing at Chicago in the matter of application by the Commercial Telephone Co. for an order authorizing the issue of $5,000 of its preferred capital stock, also for authority to issue $65,000 of its first mortgage 6 per cent gold bonds series "A."

February 25: Hearing at Chicago before Chairman Hadley in the matter of application by the Illinois Commercial Telephone Co. for an order authorizing the issue and sale of 934 shares of its common capital stock and $500,000 of its first mortgage 5 per cent gold bonds.

INDIANA.

February 8: Petition filed for increase in rates for the Big Springs Telephone Co. Petition states that lines of company in Boone, Hamilton and Clinton counties were damaged by sleet storm and there is not sufficient money in the company treasury to repair the lines.

February 14: Northern Indiana Telephone Co. authorized to use its own facilities in the routing of toll messages originating at its Bourbon and Etna Green exchanges and destined to Warsaw or independent points beyond and the Commercial Telephone Co. authorized to accept toll messages when so routed upon the express condition that nothing shall be construed as affecting the right of the Commercial Telephone Co. to route toll messages originating at its Warsaw exchange or independent points beyond over its own facilities when destined to the Bourbon or Etna Green exchange of the Northern Indiana company.

February 15: The Rochester Telephone Co. authorized to enforce the same rates, rules and regulations at Talma and Whippoorwill exchanges as are authorized at its other exchanges.

MINNESOTA.

February 17: Free service between the Northfield exchange of the Tri-State Telephone & Telegraph Co. and the Webster, Lonsdale and New Market exchanges of the Webster Farmers Telephone Co. ordered to be discontinued, such discontinuance to become effective upon the construction and cutting into service of proper toll circuits between the exchanges, and thereafter the schedule of toll rates on file with the commission shall apply on messages between exchanges of the Webster Farmers Telephone Co. and Northfield and to points beyond Northfield.

February 18: Commission's order of February 10 directed to Northwestern Bell Telephone Co., ordered to apply with equal force and effect to the French Rural Telephone Co. of Fergus Falls, Ottertail county. Commission's former order fixed the switching charge for a number of rural companies to be fixed at $3.00 per year per subscriber.

MISSOURI.

February 4: Application approved of Charles Mahon to sell and Ozark Central Telephone Co. to purchase telephone exchange at Linn; and for cancellation of order entered July 10 in case authorizing sale of exchange to Midwest Telephone Co.

February 5: Application filed by Middle States Utilities Co. of Mo. for permission to file an amended rate schedule for Bethany.

February 17: Hearing on application of Indiana Central Telephone Co. to acquire and hold more than 10 per cent of capital stock of Central Missouri Telephone Co.

February 19: Proposed new schedules of rates to be charged by the Scotia Telephone Co. for exchange telephone service at Festus and Crystam City, filed with commission.

February 21: Application approved of L. Q. Adamson to sell and T. J. Preddy to purchase the telephone exchange at Fairview.

NEW YORK.

February 25: Hearing at Albany on motion of the commission as to rates, charges and rentals and regulations and practices affecting the rates, charges and rentals of the New York Telephone Co. At the hearings on February 18 and 19, the company presented testimony showing that in the opinion of its experts, it could have boosted its rates even higher than it had proposed and still remain within the 7 per cent limite which was fixed by the federal court.

OHIO.

February 18: Hearing of the Ohio Bell Telephone rate case resumed. The hearing covered valuation of central office equipment placed by the company at approximately $10,000,000, which valuation the state contends should be reduced by about half. Witnesses who have testified heretofore as to the value of this property were cross-examined.

OKLAHOMA.

February 21: Hearing in the matter of the complaint of the Southwestern Bell Telephone Co. vs. the Continental Telephone Corp. alleging violation of commission order Nos. 912 and 1668.

February 21: Hearing on application of the Western Telephone Corp. for authority to discontinue free service between Marshall and Lovell.

February 21: Hearing on application of J. H. Geestin, et al for restoration of telephone service between Watonga and Greenfield.

February 6: Six protests against the proposed relocation of territory of the Cumberland Valley Telephone Co. and Bell Telephone Co. of Pennsylvania were lodged at hearing of application.

The protests were made by the Keystone Telephone Co. of Philadelphia, New Kingston Rural Telephone Co., Mechanicsburg Chamber of Commerce, Success Grange No. 159, Dauphin, Middletown Board of Trade and a group of 40 telephone-users of Dauphin and Halifax.

All but one of the protests were against proposed lowering of the minimum rate charge and institution of toll charges for hitherto free service over a wide territory. The Keystone Telephone Co. protested the proposed merger on the grounds that the arrangement would prevent it from extending its leased circuit territory in the south central section of Pennsylvania.

SOUTH DAKOTA.

February 15: Dakota Central Telephone Co. authorized to place in effect after March 1, schedule of increased rates for service furnished at Britton, Amherst, Kidder, Newark and Lake City, which exchanges are switched at the Britton office; in another order to increase its rates at Veblen and in another order to increase its rates for service furnished at Hecla and Houghton and upon its rural lines connected with its exchange at Hecla.

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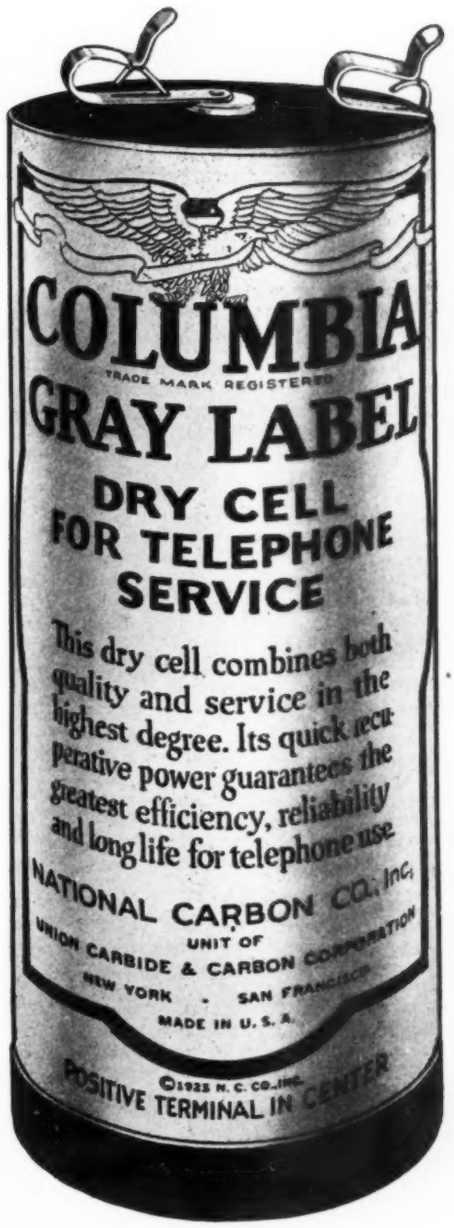
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Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

New Incorporations and New Telephone Companies.

LITTLE ROCK, ARK.—The Western Arkansas Telephone Co. of Logan county filed an amendment to its charter, authorizing the issuance of 900 additional shares of preferred stock. S. A. Lane is president of the company and J. L. Lane, secretary.

COATESVILLE, IND.—The Coatesville Telephone Co. has been incorporated with a capital stock of 1,200 shares having a par value of $10 each. The incorporators are Frank L. Brown, J. J. Gambold, William McAninch, Enoch Etchason, Mary Starr, H. H. Hill, John Greenlee, W. E. Greenlee, Arthur W. McClure, C. P. Knight, W. T. Beck, Hertha M. Harris, G. W. Bryant, Draper & Bryant, E. E. Wallace and B. L. Draper.

RAYMOND, S. D.—Articles of incorporation were filed with the secretary of state for the Raymond Telephone Co., to construct a rural telephone system in Clark and Spink counties, with a capital of $25,000. Incorporators are Henry Kalin, N. E. Hurburt and E. E. Meyer.

Financial.

NEW YORK, N. Y.—The directors of the American Telephone & Telegraph Co. at their meeting on February 19, declared the regular quarterly dividend of $2.25 per share payable April 15, to stockholders of record at the close of business on March 14.

PHILADELPHIA, PA.—Stockholders of the Keystone Telephone Co. have been called to vote on April 28 on converting and classifying the capital stock, which now consists of 200,000 shares of no par preference stock and 50,000 shares of $50 par common stock, so that it will consist of 40,000 shares of no par preference stock and 50,000 shares of $50 par common stock. They will act also on a proposal to issue $5,000,000 debenture notes.

Construction.

BOSTON, MASS.—At its regular monthly appropriation meeting in February the executive committee of the New England Telephone & Telegraph Co. authorized the expenditure of $5,932,722 for new construction and improvements in plant, necessary to meet the demand for service. Including this authorization, the specific commitment of the company for plant expenditures thus far this year is $22,720,412.

For Maine the appropriation aggregates $1,228,784; for New Hamshire, $96,946; Vermont, $57,169; Massachusetts, $4,253,588; Rhode Island, $236,235.

Of the amount authorized approximately $2,500,000 is appropriated for buildings, $148,641 for land, $235,121 for central office equipment, $36,154 for station equipment, $675,420 for exchange lines, $765,562 for toll lines, $138,960 for extraordinary repairs, and $985,625 to cover the total cost of hundreds of routine additions to plant in all parts of the company's territory during March.

Elections.

CAMBRIDGE, ILL.—Erman A. King was re-elected president of the Cambridge Mutual Telephone Co. at the annual meeting recently and other officers re-elected, as follows: O. E. Sanquist, vice-president; Ray A. Blomgren, secretary; John Gault, treasurer; Herbert Poppleton, manager and George G. Johnson, assistant manager. The company announced a new toll rate of 10 cents for the first five minutes and five cents for each additional three minutes between Cambridge and Kewanee as against the 10-cent charge for a call, regardless of the time consumed.

CHICAGO, ILL.—At the annual stockholders' meeting of the Illinois Bell Telephone Co., held February 26, all the company directors were re-elected.

COAL VALLEY, ILL.—J. C. McWhinney was reelected president of the Coal Valley Telephone Co. at a meeting held in Coal Valley central offices. William McElwain was reelected vice-president and James Lees secretary and treasurer.

FORRESTON, ILL.—Stockholders of the Forreston Mutual Telephone Co. held their annual meeting recently, at which Henry Gerwig, A. H. Rademaker, Dan Fosha and John H. Meiners were elected as directors for a term of three years. Hiram DeWall was elected president, Joe Frey vice-president and general manager, John H. Meiners, secretary and treasurer, T. J. Cordes of German Valley, assistant manager, and Harm Meiners, purchasing agent.

GALESBURG, ILL.—The Intra State Telephone Co. recently elected G. B. Churchill, president; A. L. Weinberg, vice-president; R. G. Roadstrum, secretary; C. E. Marsh, treasurer; O. N. Custer, assistant treasurer; F. C. Woods, general manager; R. G. Roadstrum, manager, and Wilfred Arnold, attorney.

GALVA, ILL.—The annual meeting of the Galva Telephone Co. was held recently, at which the same officers and directors were elected. George D. Palmer is president, F. U. White, vice-president and R. P. Dexter, secretary, treasurer and general manager. Directors are C. W. Wiseman, George D. Palmer, F. U. White, F. H. House, S. T. Dexter and R. P. Dexter.

GENESEO, ILL.—G. H. Quillin, president, and Carl H. Burgston, secretary-treasurer of the Colona-Cleveland Telephone Co., were re-elected at the company's annual meeting. Will Laverenz, George Swanson, Andrew Deem and Arthur Davis were named directors.

HILLSDALE, ILL.—The Crescent Telephone Co. held its annual meeting and election of officers recently. Reports of the secretary and treasurer were heard and accepted. The following officers were elected: President, E. H. McMurphy, Hillsdale; vice-president, H. H. Palmer, Hillsdale; secretary, Charles Guthrie, Erie; treasurer, R. C. Palmer, Hillsdale. Directors are William Vogt, Canoe Creek; John Winterfeldt, Coe; George Wainwright, Zuma; Seth Wilson, Fenton; Charles Pfundstein, Erie; Kirk Thomson, Erie, and Wesley Hudson, director at large.

MORRISON, ILL.—Officers and directors of the Morrison Telephone Co. have been re-elected as follows: J. A. Riordan, president; R. S. James, vice-president; F. Trautwein, secretary-treasurer and general manager. These officers with E. A. Smith, Frank Wear, J. L. Costenryk and R. A. Norrish, comprise the board of directors. During the year the company took over the Fulton exchange and reports showed an expenditure of $10,000 in improvements and betterment of its service facilities.

IVESDALE, ILL.—The stockholders of the Farmers' Mutual Telephone Association of Ivesdale held their annual stockholders' meeting recently, at which Thomas Anders and James White were reelected for three years. David Morris was reelected as president; Thomas J. Cannon as vice-president and J. J. Doyle as secretary and treasurer.

LITCHFIELD, ILL.—At the annual meeting of the Farmers' Telephone Co. held recently, the following directors were elected for the coming year: J. A. Herring, Lester Corey, Bert Van Patten, A. E. Ferry, W. A. Coplin, W. S. Adams, J. D. Hawkes, John Lambright, F. A. Gorden and Frank Burbank. Later the following officers were elected: President, W. A. Coplin; vice-president, W. S. Adams; secretary, J. D. Hawkes; treasurer, F. A. Gorden.

LYNN CENTER, ILL.—The Lynn Mutual Telephone Co. held its annual meeting recently and elected the following officers: President, Otto Lundberg; vice-president, Edward Lindquist; secretary-treasurer, N. H. Swanson; directors, Stanley Bloomberg, Will Lindstrom and Wallace Peterson.

ORION, ILL.—The annual meeting of the stockholders of the Orion Telephone Exchange was held recently and the following officers elected:

President, C. A. Asplund; vice-president, G. H. Wayne; treasurer, F. O. Swanson; manager, George P. Wilson; assistant manager, E. R. Wilson.

The directors are C. A. Asplund, G. H. Wayne, George P. Wilson, F. O. Swanson and E. R. Wilson.

PORT BYRON, ILL.—Reports given at the annual meeting of stockholders of the Port Byron Telephone Co. show that the volume of business received during 1929 was greater than in any previous year. Directors were elected as follows: John C. Mose and Byron M. Skelton, three years; William Groh and Almer H. Skelton, two years; W. H. Ashdown, William McRoberts and Louis D. Eipper, one year. Officers elected are: President, W. H. Groh; vice-president, L. D. Eipper; secretary, Byron M. Skelton; treasurer, William McRoberts; auditor, J. C. Mose.

RUSHVILLE, ILL.—Officers of the Schuyler Telephone Co. were re-elected at the annual meeting recently as follows: James E. Peck, president; William L. Demaree, vice-president; Miss Eva Ross, secretary. Mr. Peck has taken over duties as treasurer also. The officers and J. L. Little and Don Ward comprise the board of directors.

SHERRARD, ILL.—Frank Beard was elected president of the Farmers' Mutual Telephone Exchange at the stockholders' annual meeting here and Guy Hutchinson vice-president. John W. Bailey was named secretary-treasurer.

STOCKTON, ILL.—Officers of the Stock-

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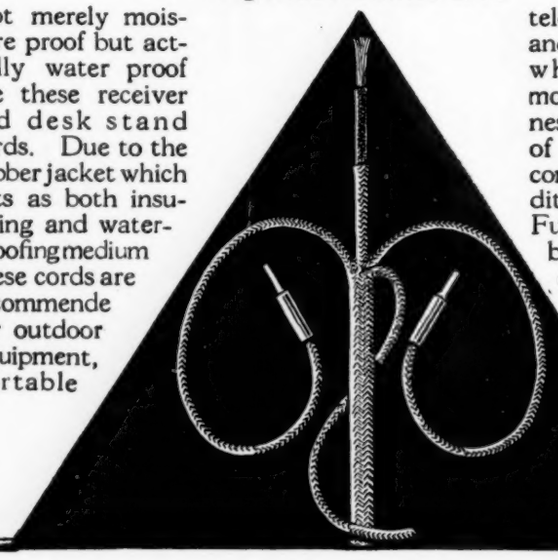

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Chicago

ton Telephone Co. have been re-elected as follows: Henry Dittmer, president; H. V. Broders, vice-president; Leonard Arp, secretary and George Dittmer, treasurer.

TAMPICO, ILL.—The Tampico Farmers' Mutual Telephone Co. held its annual meeting and election of officers recently, the officers chosen being H. A. Maxfield, president; J. D. Daley, secretary and manager; Oscar Wetzell, treasurer; directors, E. B. Cummings, Oscar Wetzell and W. N. Smith. The report of the treasurer showed a balance on hand of $7,406. A dividend was declared.

WATAGA, ILL.—Reports on the year's business of the Wataga Mutual Telephone Co. were given at a meeting of directors held recently.

Edward Frome was elected president of the company. Other officers selected were: Leonard Weber, vice-president; A. E. Olson, secretary; Arthur Anderson, treasurer, and S. R. Parkinson, director for a period of three years.

COLFAX, IND.—The annual meeting of the People's Cooperative Telephone Co. was held recently, at which the 1929 board of directors was retained with the following officers: President, Burr Bailey; secretary-treasurer, Maude Rosenberger. The remaining members are John C. Dukes, Henry Laughrey and Jesse Bailey. The stockholders received a 10 per cent dividend.

FRANCISCO, IND.—The Francisco Telephone Co.'s annual election was held recently. The officers named are: Thomas J. McEllhiney, manager, secretary and electrician; George Holland, president; Charles Mans, treasurer.

HUNTINGTON, IND.—E. P. Beaver of Union township was elected president of the Majenica Telephone Co. during a meeting of stockholders here. Other officers named are J. P. Shutt, vice-president, and Harry Bonewitz, secretary-treasurer. Bert Noggle was named director of the Majenica district.

RICHMOND, IND.—All members of the board of directors and officers of the Richmond Home Telephone Co., Richmond, Ind., have been re-elected and Thomas Swaner is retained as manager. Officers are J. M. Lontz, president; E. H. Gates, vice-president, and Miss Alice L. Maley, secretary-treasurer. The directors are: S. W. Gaar, Alice L. Maley, H. R. Lontz, J. M. Lontz, E. G. Gates, A. C. Lindemuth, Gath Freeman and Thomas Swaner.

THORNTOWN, IND. — The Thorntown Telephone Co. recently held its annual board meeting. Lewis Beesley, Joseph Goldsberry and W. C. Stout were re-elected directors. A report of the year's business was given by Lloyd Stout, manager of the company.

WABASH, IND.—At the annual stockholders' meeting of the Home Telephone Co. N. G. Hunter was named president; W. H. Webber, vice-president; W. H. Van Horn, second vice-president and general manager; H. E. Wallace, secretary, and John Hipskind, treasurer. The latter begins his 35th year as treasurer of the company.

POLK, IOWA.—The following were elected directors of the Polk City Telephone Co. for 1930: A. F. Miller, L. C. Swim, Guy Harshbarger, Dr. Tyler, and R. P. J. Gemricher. The directors elected: R. P. J. Gemricher, president; Dr. C. W. Tyler, vice-president; E. P. Blaine, secretary; A. F. Miller, treasurer.

REMSEN, IOWA.—The annual election of the West Iowa Telephone Co. resulted in the retention of all old officials, who are as follows: President, T. Kloster; vice-

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president, J. P. Beck; secretary-treasurer, W. H. Daubendiek; assistant secretary, Wm. Daubendiek, and directors, Wm. Heitmann, H. J. Reimers, Wm. Schempf and Peter Eulberg.

Mr. Reimers was named as general manager, Mr. Daubendiek will be in charge of the traffic department, and Peter Eulberg is retained as commercial manager.

SHELDAHL, IOWA.—John Scott was elected president of the Sheldahl Telephone Co. at the company's annual meeting. Fred Croft was elected secretary, Harry Young, treasurer and G. C. Alleman, LeGrant Smith, E. W. Berggren and Louie Buche, directors.

UTE IOWA—The Soldier Valley Telephone & Telegraph Co. held its annual meeting of stockholders here and the following officers were elected: President, Henry Neddermeyer; vice-president, Gust Marten; secretary and manager, A. L. Lafrentz; directors, F. H. Neddermeyer, Charles Mohn, John Hartigan, Henry Gosch and John Luth.

WEST LIBERTY, IOWA.—The West Liberty Telephone Co. reelected officers at its annual meeting recently as follows: A. L. Dice, president; T. E. Fountain, vice-president; B. W. Rowlen, secretary; Frank Weber, treasurer. H. B. Mellick was reappointed manager.

WHEATLAND, IOWA.—The Farmers & Business Men's Mutual Telephone Co. of Wheatland and Calamus held its annual meeting recently, when the following officers were reelected for another year: President, George Raiber; vice-president, William Hoker; secretary, Carl Lohmann; treasurer, William Siegmund. Two new directors were elected, Tom O'Niel and Hans Olson, to serve in place of Engel Christiansen and Mr. Shelton, whose terms had expired.

INMAN, KANS.—The stockholders of the Inman Mutual Telephone Co. in annual meeting here elected the old board of directors: G. H. Balzer, J. F. Enns, John Hahn, J. G. Neufeld, P. M. Doerhsen. H. E. Toews was reelected manager and C. M. Toews will again serve as secretary-treasurer.

AUGUSTA, KY.—At a meeting of stockholders of Northern Kentucky Co. at which more than 90 per cent of the stock was represented, the following officers and directors were elected: President, C. R. Bradley; vice-president, Dr. J. C. Browning; secretary, J. D. McKibben; treasurer, C. L. Hook; assistant, J. R. Matthews.

The chairman of the board of directors is Barrett Waters. Directors are Barrett Waters, J. D. McKibben, George S. Taylor, Earl Charles, J. C. Browning, J. R. Matthews, C. R. Bradley, Donald Griffith, C. L. Hook, Edwin Byard and W. A. Steen. Stockholders from Campbell, Pendleton, Bracken, Mason and Robertson counties were at the meeting. It was decided to continue extension of the service to the western half of Mason county at once.

BRIDGMAN, MICH.—The new officers of the Citizens Telephone Co. elected for this year are: President, Bud Keith; secretary-manager, Arthur English; treasurer, Fred Gast; directors, Tom Sowersby and J. M. Freeman.

KANDIYOHI, MINN.—At the annual meeting of the Kandiyohi County Telephone Co., the following directors were elected: Fred Lindquist, C. J. Nelson, A. O. Nelson and Nels Anderson. The directors then organized and elected the following officers: John Kleberg, president; Phillip Haley, vice-president; Nels Anderson, secretary-treasurer and manager.

LE SUEUR, MINN.—The following officers were elected at the regular annual meeting of the Farmers & Merchants Telephone Co.: President, C. B. Randall; vice-president, George K. Gann; secretary, R. F. Wilder; and treasurer, A. C. Cragg. George W. Robinson, O. A. Pinney and S. S. Striker were named on the board of directors.

VIOLA, MINN.—George L. Wood was elected president of the Viola Telephone Co. at the annual meeting of stockholders. Other officers chosen were: William F. Schmidt, vice-president; E. A. Steichen, secretary and manager; August Beck, treasurer, and August Beck, E. A. Steichen, A. F. W. Schmidt, directors.

WYKOFF, MINN.—The Wykoff Cooperative Telephone Co. held its annual meeting recently, at which all officers of the preceding year were reelected, namely: President, Matt Quinn; secretary, Wm. Mulhern; treasurer, John Wendorf; manager, E. C. Schatz; directors, Irvin Bacon and Ed Jeche.

MAITLAND, MO.—At a meeting of the directors of the Farmers Mutual Telephone Co. Frank Gibson was re-elected president, C. E. Wright vice-president, and Mrs. N. B. Stevens secretary-treasurer.

CHATHAM, N. Y.—Dr. H. B. Ambler, of Chatham, was reelected president of the Chatham Telephone Co. at the annual meeting of the stockholders.

Dr. F. DuBois Smith, of East Chatham, was elected vice-president; Samuel Kauffman, treasurer, and Lester Gifford, secretary.

The directors who will have charge of the affairs of the company for the ensuing year are Dr. H. B. Ambler, F. Du Bois Smith, Lester E. Gifford, Samuel Kaufman, Aaron Garner, L. Eberle, N. Ashley and W. P. Boright.

CLYMER, N. Y.—The annual meeting of the stockholders of the Clymer Telephone Co. was held recently and the following directors elected: Edward Wiggers, Leon Legters, T. J. Legters, Henry Gravnik, S. C. Ton, G. H. Tenpas, Edward Neckers, R. V. A. Hewers, Henry Wassink, Frank Meyerink and J. D. Gallup. A meeting of the directors was then held and J. D. Gallup was again elected president; Elmer Neckers, vice-president, and Edward Wiggers, secretary and treasurer.

GLOVERSVILLE, N. Y.—The annual meeting of the stockholders of the Glen Telephone Co. was held recently and the following directors elected: J. F. O'Connell, T. R. Hefty, E. T. B. Schubring, S. L. Odegard, Marshall E. Sampsell, G. G. W. Green and A. R. Wiley.

GENEVA, OHIO.—Officers of the Geneva Telephone Co. were elected to serve another year at the annual stockholders' meeting. They are: A. A. Searle, president; A. M. Ford, vice-president; A. W. Chamberlin, secretary. Directors were also re-elected. They are A. W. Chamberlin, A. M. Ford, George Watts, W. R. Ellis, Roy Kearns, Walter Rose and A. A. Searle.

IRONTON, OHIO.—At the annual stockholders' meeting of the Home Telephone Co. of this city, C. B. Egerton, F. L. McCauley, L. J. Gehrling, all of Ironton; F. R. Eckley and Walter Malloy of Columbus and A. L. Jones and J. H. Beilstein of

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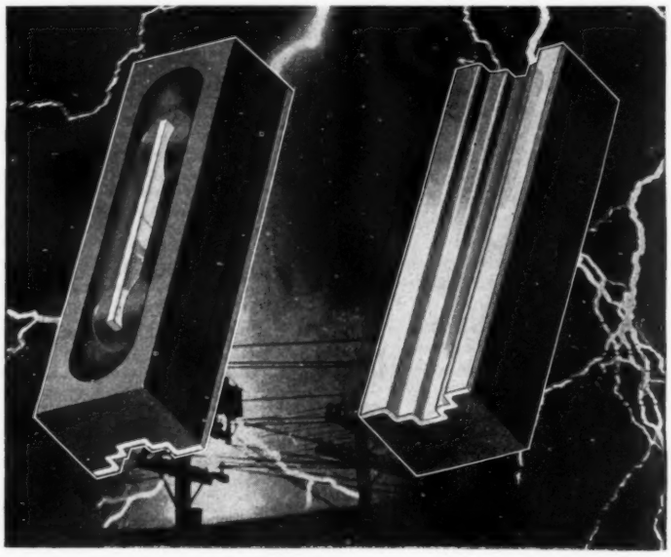

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Dayton were elected directors. C. B. Egerton was named president; A. L. Jones, vice-president; L. J. Gehrling, secretary and general manager and F. L. McCauley, treasurer. The executive committee consists of A. L. Jones, Walter Malloy and J. H. Beilstein.

LOGAN, OHIO—The annual stockholders' meeting of the Logan Home Telephone Co. was held recently, at which all the officers and directors were elected for the year. R. B. Longstreth was elected president; E. M. Martin, vice-president; J. G. Collins, secretary and general manager; H. G. Hansel, treasurer. The directors are: Emerson Poston, John Wellman, J. G. Collins, C. G. Bowen, H. G. Hansel, E. M. Martin, of Logan; R. B. Longstreth, Union Furnace; J. W. Huls, Rockbridge, and J. D. Love, Columbus.

LUCASVILLE, OHIO.—At the annual meeting of the stockholders of the Lucasville Rural Telephone Association the following officers were elected: Earl Vulgamore, president; Gaylord Preston, vice-president; Mrs. Lulu Hardin, secretary, and Ray E. Rhoades, treasurer. The directors are L. S. Luckett, Gaylord Preston, David M. McJunkin, Perry Bonner, T. F. Snedaker, J. H. Brant, W. L. Reeg, William Spriggs, Ray E. Rhoades, C. A. Moore and Earl Vulgamore.

JET, OKLA.—The Jet Rural Telephone Co. held its annual meeting and election recently, at which time the following directors were elected: Frank Nall, president; Harve Cross and Elbert Ridgway, vice-president; Perry Dunn, secretary; Clyde Tucker, treasurer.

MCCLURE, OHIO.—The Citizens Mutual Telephone Co. has elected Edward Weaver, president; A. F. R. Garster, vice-president; William Harner, secretary; William Nelson, treasurer; John Clark and Guy Shaffer, directors.

SHERWOOD, OHIO.—Officers elected by Mutual Telephone Co. are: President, Otto Luce; vice-president, J. C. Miller; secretary, D. G. Miller; treasurer, Lloyd Sprow; trustee, Fred Wesche. Christ Gaut was elected manager.

EPHRATA, PA.—The following directors and officers were elected at a stockholders' meeting of the Denver & Ephrata Telephone & Telegraph Co.: W. F. Brossman, president; D. W. Artz, secretary; D. W. Buch, treasurer; C. E. Faby, vice-president and general manager; Bertha M. Brossman, assistant secretary; J. C. Nissley and Monroe Lausch.

WAYNESBURG, PA.—The stockholders of the South Penn Telephone Co. held their annual meeting and elected directors for the coming year. They are J. N. Scott, E. V. Scott, Eli G. Baily, R. Lloyd Baily, Ralph Baily, C. R. Freehafer, John Glass, L. T. Laidley, and Challen Waychoff.

Following the election the directors met and organized. J. N. Scott was elected president of the board, Eli G. Baily, vice-president, and Challen Waychoff, secretary and treasurer.

GARRETSON, S. D.—George A. Eitreim has been elected president of the Garretson Cooperative Telephone Co. for the coming year. Anthon Olson was chosen vice-president; H. A. Meier, secretary-treasurer, and Adolph Koch, manager. All these officers served the past year.

FENNIMORE, WIS.—The annual meeting of the Fennimore Telephone Co. was held recently and all of the former officers re-elected as follows: Edward Kruel, president; Leon Blanchard, vice-president; Leo Pasold, secretary and treasurer; Robert McKinley, George Martin, Louis Schwab

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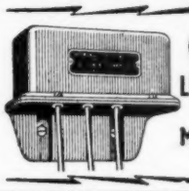
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SPRING VALLEY, WIS.—At the annual meeting of the Spring Lake Telephone Co. the following officers were elected: President, Ed Stein; vice-president, Chas. Podoll; secretary-treasurer, Otto Knegendorf. Directors are Elmer Bowell and Ed Zimmer.

WAYSIDE, WIS.—The Wayside Telephone Co. held its annual meeting recently, at which Louis Hafeman was re-elected president, Armain Blanert, vice-president, Louis Natzke, manager, John Natzke, treasurer, and Ernest Baxman, secretary.

WEBSTER, WIS.—The following directors and officers were chosen at the annual meeting of the Badger Mutual Telephone Co. held here: Charles E. Johnson, president; Otto Johnson, vice-president; Andrew Melland, secretary; Nicholas Nelson, director; F. W. Albrecht, director; August J. Christianson, director; William Anderson, director.

WEST DALLAS, WIS.—At the annual meeting of the Dallas Telephone Co. the following officers were elected: President, Sam Dyrland; vice-president, I. H. Baland; secretary, Sofus Moe; treasurer, P. P. Ecklie; manager, O. G. Lee; trustees, John Randall and Arthur Honkins.

Miscellaneous.

HIGHLAND, ILL.—Sale of the Highland Telephone Co., hitherto locally owned, to the Associated Telephone Utilities Co. of Madison, Wis., was announced recently. It operates about 250 magneto telephones and 925 common battery telephones. The company will be operated henceforth by the Illinois Commercial Telephone Co. of Murphysboro.

WINCHESTER, IND.—The Farmers Telephone Co., which went into receivership after the heavy sleet in January was sold recently by John P. Clark, receiver, to Roy Steele for $800. The company had nearly 800 subscribers and miles of line, the major part of which was broken down by the sleet. It is the intention of Mr. Steele to rebuild the line.

MANISTIQUE, MICH.—S. D. Crowe and Charles R. Button, well-known former residents here and at one time connected with the Manistique Telephone Co. are now located in Dos Palos, Calif., where both are officers of the Dos Palos Telephone Co. Mr. Crowe has purchased controlling interest in the company. He was formerly chief owner of a telephone company at La Grande, Ore.

EKALAKA, MONT.—George A. Sykes, manager of the Ekalaka Telephone Co. has entered into a contract with J. S. Winsor of Brandon, Iowa, providing for the sale of the telephone line to Mr. Winsor. The latter is expected to arrive in Ekalaka this month to take over the property, and he plans on making extensive improvements. The building used as the telephone exchange was not included in the sale.

NYNOT, NEB.—Victor Nelson, of Crofton, where he has been agent for the North Western railroad company, has purchased the interest of F. R. Beyschau in the Wynot Telephone Co., and took charge on March 1. Mr. Nelson formerly lived in Wynot, and being the son-in-law of Mr. Beyschau, is familiar with the problems of telephone companies. He will be manager.

GOLDTHWAITE, TEXAS—The Southwestern Telephone Co. took over the Rural Telephone Co. of Mills county recently with exchanges at Goldthwaite and Mullin. J. H. McKee of Brownwood will have charge of the division, while John Skipper will be local representative.

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A1.
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C7, E4, G2, K1, K4, M6, S10.
Appraisers
P5, U4, W2.
Arms and Brackets (for Holding Telephones)
A4, H7, K1.
Arresters, Lightning (See Protective Devices)
Auditing, Accounting and Systems
B11, C19, H6, S10.
Automatic Telephones
A9, A12, E5, K1, N2, S6, S12.
Battery Charging Equipment
F1, F6, G5, U5, W7.
Batteries, Dry General Purpose
A4, B4, C2, G1, H8, N1, S10, W9.
Batteries, Dry, Radio "A," "B" and "C"
A4, C2, F6, G1, N1, U5.
Batteries, Flashlight
C2, F6, G1, N1.
Batteries, Primary
W9.
Batteries, Storage
A14, E3, K1, P9, P5.
Bells, Magneto
A4, G2, H5, K1, N2, S4, S10.
Belts and Safety Straps (Linemen's)
K3.
Blank Books (etc.)
F3.
Blowers, Portable
H8.
Books, Telephone
M8.
Brushes—Carbon—Graphite and Metal Graphite Motors, Generators and Rotary Converters
N1.
Brackets, Drop-Wire
P8, S10.
Cable
A5, B6, E5, H1, K1, R3, S10.
Cable Compound
A7, N10.
Cable Rings
E4, N5.
Cable Splicing Joints
M6.
Cable Terminals
C8, G2, R2, S2, S10.
Clamps, Ground (Plates, Cones)
G2, L2, P2.
Clamps, Guy
A7, C8, E4, G2, L2, M6, N5, R2.
Climbers
G2, C12, K3.
Clips, Cable
A4, G2, L2, M6.
Clips, Testing
F5, G2.
Condensers
A4, A9, G2, K1, L2, S9, W1.
Conduit, Clay
C6, N3.
Conduit, Treated
C13, G2, W6.
Conduit Rods
C9, G2.
Connectors, Test
C8, R2, S8.
Cords, Telephone and Switchboard
A4, A9, G2, K1, R5, S9.
Counters
V3.
Cross Arms
A4, A10, A11, G4, K1, S10, T7, W6.
Directory Publishing and Advertising Service
B7.
Electrical Wires and Cables
R3.
Extension, Relays
K1, S4.
Engineers, Telephone
B1, C10, F4, J3, M4, P5, S7, U4.
Financial Service
A8, C11, C15, K2, M7, P3, R5, S1, T1, U4, W5.
Fire Pots and Furnaces
W4.
Furnaces, Lead Melting
L4.
Furnaces, Compound
L4.
Fuses, Mica
A4, C8, R2.
Generators, Ringing
G2, H5, K1, L3.
Generators, Portable
H8.
Guy Stretchers
H3.
Hangers, Cable
C8, E4, G2, K1, L2, N5, R2, S7.
Hoist and Guy Clamps
C3.
Induction Coils
A4, A5, K1, L3, M6, S8.
Instruments, Electrical Measuring
W1.
Insulators
C16, G2, H2, P2, S10, T3, U1.
Insulating Compounds
N10, S7.
Insurance, Fire and Employers' Liability
B10.
Intercommunicating Systems
A4, K1, S9.
Jacks, Pole
A4, C9, G2, K1, S9, S10, T2, W3.
Keys, Switchboard
A4, K1, L3, S9.
Lockers, Steel
L5.
Meters (Electrical Testing and Measuring)
G2, S8, W1.
Pliers
A4, C12, F7, G2, K1, K3.
Pole Line Hardware
A4, G2, K1, L2, N5, O1, S10, T7, W3.
Pole Pullers
G2, T2.
Pole Straighteners
G2, T2.
Pole Steps
G2, L2.
Poles, Treated or Plain
A2, A11, B3, B5, C5, F8, I3, K7, L1, M1, N6, P1, P3, P4, S5, T6, T7, W6.
Printed Telephone Forms
F8, S10.
Protective Devices
C3, C8, M3, R2, S2.
Pumps, Centrifugal Portable
H8.
Radio Supplies
A4, K1, L3, S9.
Rebuilt Telephone Apparatus
B15, P6, R1, S10.
Rectifiers
F1, W7.
Relays, Loud Ringing Calling Systems, Signals
K1, N2, S4.
Reels, Pay-out and Takeup
M6.
Remote Control Systems
N2.
Ringing Machines
T3.
Searchlight, Portable
N4.
Shelving, Metal
L5.
Sleeves, Paper
C8, R2.
Soldering Supplies
K5.
Staples, Insulated
B9.
Switchboard, Lamps
N8.
Switchboards, Telephone
A4, A9, G2, K1, L3, N2, S9, S10, W3.
Tanks, Portable
P7.
Tape (Splicing)
G2, S9.
Telephones
A4, A9, G2, K1, L3, N2, S9, S10, W3.
Telephone Directories
B7, W5.
Telephone Supplies (Jobbers)
A4, G2, K1, S9.
Teletype
T4.
Telephone Typewriters
T4.
Telephone Wire (Copper & Galvanized)
R3.
Tents, Aerial Splicer.
U2.
Testing Sets
A4, H1, M6, S8, W1.
Timing Devices
C1, E5.
Tool Boxes, Steel
L4.
Torches, Blow
B8, P7, W4.
Transmitters
A4, A9, G2, K1, L3, S9, W3
Tree Surgeons
D1.
Tree Trimmers
G2, S3.
Trench Braces
T2.
Trench Diggers
C4.
Trucks, Motor
F2, I4.
Underground Specialties
C9, G2, N10.
Winches
C9, G2.
Wire, Aeroplane
A4.
Wire, Copper
A3, A4, A5, A7, I1, K1, R3, S9, S10, T7
Wire, Enameled and Magneto
A5, A7, G2, H1, K1.
Wire, Galvanized Iron
A5, A7, G2, H1, I1, R3, P2, S10, T7.
Wire Rope
A7, G2, R3.
Wire, Rubber Covered
A7, H1, W8.
Wire, Rubber Insulated
A2, A7, H1.
Wire, Twisted Pair
A5, G2, P2.
Wire, Weatherproof
A4, A5, A7, G2, I1, P2.
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